

# Uni-Directional Receiving Device:

## Conformance Checklist: PICS Proforma

### Uni-Dir-PICS-I01-030903

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## Table of Contents

<b>1</b>	<b>Introduction .....</b>	<b>8</b>
1.1	Scope and Applicability.....	8
1.2	Instructions for Completing the PICS Proforma.....	8
1.2.1	General Structure of the PICS Proforma.....	8
1.2.2	Additional Information .....	9
1.2.3	Exception Information .....	9
1.2.4	Optional and Conditional Items.....	9
<b>2</b>	<b>Identification .....</b>	<b>11</b>
2.1	Implementation Identification .....	11
2.2	Protocol Summary .....	11
<b>3</b>	<b>Critical PICS.....</b>	<b>13</b>
3.1	Power Management .....	13
3.2	Physical Interface.....	14
3.3	Data Channel Protocol .....	18
3.4	Other Requirements of a Uni-directional Receiving Device .....	20
3.5	Physical Interface.....	20
3.6	Data Channel Protocol .....	23
3.7	Homing .....	37
3.8	Extended Channel Protocol .....	40
3.9	Copy Protection Support.....	42
3.10	Analog Copy Protection (Macrovision) .....	44
3.11	Certificate Management.....	45
3.12	In-Band Channel Support.....	47
3.13	OOB FDC Channel Support.....	49
3.14	EAS .....	50
3.15	Ratings .....	58
3.16	FAT Channel RF Performance Parameters.....	58
3.17	FD Channel RF Performance Parameters.....	60
3.18	Digital Video.....	61
3.19	Digital Audio .....	63
3.20	NTSC Analog Channels.....	63
3.21	Analog Closed Caption.....	63
3.22	Digital Closed Caption .....	64
3.23	High Definition Support.....	65

3.24... Maximum Individual Carrier Amplitude.....	65
3.25... RF Signal Levels and Adjacent Channel Characteristics .....	66
3.26... Transport Stream Data Rates.....	68
3.27... Uni-Directional Receiving Device Functionality Without a POD Module.....	68
3.28... Virtual channel number processing .....	69
3.29... Mechanical .....	70
Appendix A – CableLabs/CEA Agreed Requirements Not Contained In Referenced Standards .....	70
Table 1 – CableLabs Manufacturer Root CA Certificate .....	76
Table 2 – Manufacturer CA Certificate .....	77
Table 3 Device Certificate .....	78

# 1 Introduction

## 1.1 Scope and Applicability

The supplier of a Uni-Directional Receiving Device implementation that is claimed to conform to the Uni-Directional Receiving Device specifications shall complete the following Conformance Checklist (PICS Proforma) for the implementation in question. The PICS Proforma is a statement of which capabilities and options of the protocol have been implemented. The PICS can have a number of uses including these:

- The protocol implementers may use the PICS as a checklist to reduce the risk of failure to conform to the specifications through oversight.
- A protocol tester may use the PICS as the basis for selecting appropriate tests against which to assess the claim for conformance of the implementation.
- The supplier and acquirer of the implementation may use the PICS as a common basis for understanding the compliance of the implementation.
- The user of the implementation may use the PICS as a basis for initially assessing the possibility of interoperability with another implementation. (Note that while interoperability can never be guaranteed, failure to interoperate sometimes can be predicted from incompatible PICS.)

There are some PICS items that cannot be tested as part of the unit tests and can only be tested in an interoperability environment.

## 1.2 Instructions for Completing the PICS Proforma

### 1.2.1 General Structure of the PICS Proforma

The first part of the PICS Proforma, **Identification**, should include all the information necessary to fully identify both the supplier and the implementation.

The PICS Proforma is essentially a fixed-format questionnaire divided into several major sections each containing groups of individual items. Answers to the questionnaire items are to be provided in the middle column either by simply marking an answer – usually to indicate a restricted choice such as **Yes**, **No**, or **N/A**.

Each requirement item is identified by an item reference designator in the first column (*Item*). The second column (*Feature*) describes the requirement. The third column (*Spec*) indicates which specification document contains this requirement. The fourth column (*Ref*) states the reference to the section number(s) of the specification document where the requirement is expressed. The sixth



thru eleventh column (*Stat*) indicates the status of the item for a particular profile— whether support is mandatory, optional, Informative, Not Applicable or Not Permitted indicated by **M**, **O**, **I**, **NA** or **NP** respectively. (Refer to section 1.2.4.) The middle column (*Support*) is the place for the answers.

A supplier may also provide, or might be required to provide, further information categorized as either *Additional Information* or *Exception Information*. (Refer to sections 1.2.2 and 1.2.3, respectively.) When present, this kind of information is to be provided in an attachment to the PICS. References to such information may be entered in the PICS in the *Support* column next to any answers. These references in the *Support* column are made using a label, **Ai** or **Xi**, respectively, where *i* is any unambiguous identification for the item (e.g., simply a numeral).

A completed PICS Proforma for the implementation in question includes the attached Additional Information and Exception Information.

**NOTE:** Where an implementation is capable of being configured in more than one way, single PICS may be able to describe all such configurations. However, the supplier has the choice of providing more than one PICS, each covering some subset of the implementation configuration capabilities, in case that makes for easier and clearer presentation of the information.

### 1.2.2 Additional Information

Additional Information allows a supplier to provide further information intended to assist the interpretation of the PICS. Also, a supplier may provide an outline of the ways in which a single implementation can be set up to operate in a variety of environments and configurations.

### 1.2.3 Exception Information

A supplier might choose to answer an item with mandatory status in a way that conflicts with the indicated requirement. No pre-printed answer will be found in the *Support* column for this; instead, the supplier shall write some notation in the *Support* column that includes an **Xi** reference to *Exception Information* that is attached to the PICS.

***An implementation for which Exception Information is required in this way does not conform, by definition, to the applicable Specification.***

**NOTE:** A possible reason for the situation described above is that a defect in this standard has been reported, a correction for which is expected to change the requirement not met by the implementation.

### 1.2.4 Optional and Conditional Items

The PICS Proforma may contain *optional* items. These are indicated by an **O** in the status column. An optional item is an item that **is not required** to be implemented by an applicable specification.

Optional items, if implemented, may result in ***conditional*** items, which would otherwise not be applicable. Conditional items also can have mandatory or optional status indicated by **C-M** or **C-O** respectively in the status column. When answering a conditional item in the PICS, the supplier should indicate in the support column that the item is not applicable (*N/A*) if it is conditional upon an optional item that is not implemented. Otherwise, the supplier must answer ***Yes*** or ***No*** as required. Certain products may not have the capability to process the compressed video or audio streams and may opt out of these requirements. These items are marked in the Status column by a 'CMV' or 'CMA' notation for video and audio, respectively.

Individual conditional items are distinguished by a conditional symbol of the form **<ItemName>** at the beginning of the requirement description in the *Feature* column, where *ItemName* is the item reference designator that appears in the *Item* column of the item that raised this conditional requirement.

## 2 Identification

### 2.1 Implementation Identification

Supplier	
Contact point for queries about this PICS	Vincent Pando Systems Integration Manager 303-661-3755 v.pando@cablelabs.com
Implementation Name(s) and Version(s)	
Other information necessary for full identification – e.g. names and versions of machine(s) and operating system(s)	

### 2.2 Protocol Summary

		Comments
Identification of Protocol Specification(s) – HOST – POD Interface	<b>HPIA</b> ANSI/SCTE28 2001 (As amended by DVS-519r2) HOST-POD Interface Standard	
	<b>HPIB</b> EIA-679-B (Part B) National Renewable Security Standard March 2000	Secondary reference of ANSI/SCTE28 2001 (As amended by DVS-519r2) HOST-POD Interface Standard
	<b>HPID</b> ANSI/SCTE 55-2 2002 Digital Broadband Delivery System: Out of Band Transport Part 2: Mode B	Secondary reference of ANSI/SCTE28 2001 (As amended by DVS-519r2) HOST-POD Interface Standard
	<b>HPIE</b> ANSI/SCTE 55-1 2002 Digital Broadband Delivery System: Out of Band Transport Part 1: Mode A	Secondary reference of ANSI/SCTE28 2001 (As amended by DVS-519r2) HOST-POD Interface Standard
	<b>HPIL</b> SCTE 54 2003 Digital Video Service Multiplex and Transport System Standard for Cable Television	Secondary reference of SCTE 40 2001 (As amended by DVS 535) Digital Cable Network Interface Standard
	<b>HPIN</b> ANSI/SCTE 41 2003 POD Copy Protection System	

	<b>HPIQ</b>	PC Card Standard, Volume 2 Electrical Specification, March 1997, Personal Computer Memory Card International Association, Sunnyvale, CA.	Secondary reference of ANSI/SCTE28 2001 (As amended by DVS-519r2) HOST-POD Interface Standard
	<b>NIF</b>	ISO/IEC 13818-1:2000 MPEG-2 Systems	Secondary reference of SCTE 40 2001 (As amended by DVS 535) Digital Cable Network Interface Standard
	<b>NIQ</b>	ANSI J-STD-042-2002 Emergency Alert Message for Cable	Secondary reference of ANSI/SCTE28 2001 (As amended by DVS-519r2) HOST-POD Interface Standard
	<b>NIR</b>	ANSI/SCTE 65 2002 Service Information Delivered Out Of Band for Digital Cable Television	Secondary reference of ANSI/SCTE28 2001 (As amended by DVS-519r2) HOST-POD Interface Standard
	<b>NIT</b>	ATSC A/52A Digital Audio Compression (AC-3) Standard	Secondary reference of SCTE 40 2001 (As amended by DVS 535) Digital Cable Network Interface Standard
	<b>NIU</b>	SCTE 43 2003 Digital Video Systems Characteristics Standard For Cable Television	Secondary reference of SCTE 40 2001 (As amended by DVS 535) Digital Cable Network Interface Standard
Identification of Protocol Specification(s) – HOST			
	<b>HB</b>	EIA/CEA-818-D Cable Compatibility Requirements	
	<b>HD</b>	ATSC A/53B ATSC Standard: Digital Television Standard, Revision B, with Amendment 1	Secondary reference of SCTE 40 2001 (As amended by DVS 535) Digital Cable Network Interface Standard
	<b>HE</b>	ATSC A/65B Program and System Information Protocol for Terrestrial Broadcast and Cable	Secondary reference of SCTE 40 2001 (As amended by DVS 535) Digital Cable Network Interface Standard

### 3 Critical PICS

Critical Test PICS item is a PICS item that is essential to ensure the device under test (A) can tune and display (TV products) scrambled digital services via the POD conditional access system, (B) will not technically disrupt, impede or impair delivery of services to cable subscribers, (C) will not cause physical harm to the cable network or the POD, (D) will not facilitate theft of service or otherwise interfere with reasonable actions taken by Cable Operators to prevent theft of service, (E) will not jeopardize the security of any services offered over the cable system, (F) will not interfere with or disable the ability of a Cable Operator to communicate with or disable a POD Module or to disable services being transmitted through a POD Module, or (G) will not impede or impair control of content protection. All other tests are called Non-critical Tests.

#### 3.1 Power Management

Item	Feature	Spec	Ref	Support	Status
Hpower.3	The Uni-Directional Receiving Device SHALL be capable of keeping the voltage within tolerance and provide the POD module power within the supply tolerance of section 6.1.2 of reference HPIA	HPIA	6.1.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
Hpower.4	The Uni-Directional Receiving Device SHALL be capable of supporting a simultaneous draw on each VCC pin up to 500ma while maintaining 3.3 VDC +/- 0.3 VDC per POD supported.	HPIA	6.1.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
Hpower.5	The Uni-Directional Receiving Device SHALL be capable of supporting a draw of up to 250mA while maintaining 3.3V +/- 0.3 VDC (per POD) on the VPP pins before reading the Card Information Structure (CIS).	Appendix A	R-1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
Hpower.5 A	The Uni-Directional Receiving Device SHALL be capable of supporting a draw of up to 250mA while maintaining 5V +/- 5% on the VPP pins after reading a Card Information Structure (CIS) request for 5V VPP.	HPIA	6.1.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
Hpower.7	After reading the CIS, the Uni-Directional Receiving Device SHALL provide the voltage requested by the CIS, per POD. The two VPP voltage levels allowed are 3.3 volts and 5 volts.	HPIA	6.1.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
Hpower.6	The Uni-Directional Receiving Device SHALL support 3.3V hot insertion.	HPIA	6.1.2.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

Hpower.8	The Uni-Directional Receiving Device is not required to support separate power supply to VPP1 or VPP2 and may ignore descriptor structures if a value of 0x3h in the Power field of the Feature Selection Byte (TPCE_FS) is presented to a Uni-Directional Receiving Device from the POD CIS. If the Uni-Directional Receiving Device does not support this, the Uni-Directional Receiving Device SHALL continue to supply a nominal voltage of +3.3 V on both VPP pins.	HPIA	6.1.2		M
Hpower.8 A	If the Uni-Directional Receiving Device does support the value of 0x3h in the Power field of the Feature Selection Byte (TPCE_FS), the Uni-Directional Receiving Device SHALL supply either 3.3V or 5V as requested on VPP1 and VPP2 pins.	Appendix A	R-2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	C-M
Hpower.9	The Uni-Directional Receiving Device SHALL fully power the POD and OOB receive circuitry (OOB tuner, demodulator, CRX and DRX pins) at all times AC power is available to the Host and the POD is inserted, after the POD has been initialized.	HPIA	6.1.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
Hpower.9 a	If the Uni-Directional Receiving Device is operating in the Polling mode, it SHALL poll the POD no less frequently than once every 100 mSec.	Appendix A	R-3a	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
Hpower.9 b	If the Uni-Directional Receiving Device is operating in the interrupt mode, it SHALL respond to interrupts within 100 mSec and poll the POD no less frequently than once every 5 seconds.	Appendix A	R-3b	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

## 3.2 Physical Interface

Item	Feature	Spec	Ref	Support	Status
<b>PCMCIA Interface Initialization</b>					
HPPII.8	The OOB receive interface MAY be connected to the Uni-Directional Receiving Device all of the time.	HPIA	6.7		I
HPPII.9	After the personality change sequence, the OOB receive interface SHALL be connected to the POD.	HPIA	6.7	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPPh.1	The Uni-Directional Receiving Device SHALL accept both Type I and Type II PC Cards.	HPIB	A.5.4.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPPh.3	The Uni-Directional Receiving Device SHALL have PC Card connector	HPIB	A.5.4.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

	described in Section 4 of PC Card Standard, Volume 3 - Physical Specification.				
HPPh.4	The Uni-Directional Receiving Device SHALL have PC Card guidance described in Section 5 of PC Card Standard, Volume 3 - Physical Specification.	HPIB	A.5.4.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	The POD will have grounding and EMI clips described in Section 6 of PC Card Standard, Volume 3 - Physical Specification.	HPIB	A.5.4.4		I
HPPh.6	The Uni-Directional Receiving Device SHALL have connector reliability described in Section 7 of PC Card Standard, Volume 3 - Physical Specification.	HPIB	A.5.4.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPPh.7	The Uni-Directional Receiving Device SHALL have connector durability described in Section 8.2 (harsh environment) of PC Card Standard, Volume 3 - Physical Specification.	HPIB	A.5.4.6	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPPh.21	The Uni-Directional Receiving Device SHALL comply with Attribute Memory Timing functions described in Section 4.7 of PC Card Standard, Volume 2 - Electrical Specification.	HPIB HPIQ	A.5.5.6 4.7	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPPh.26	The Uni-Directional Receiving Device SHALL detect POD insertion and removal using CD1# and CD2# as described in Section 4.10 of PC Card Standard, Volume 2 - Electrical Specification.	HPIB HPIQ	A.5.5.8 4.10	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPPh.29	The Uni-Directional Receiving Device and the POD SHALL comply with I/O function described in Section 4.13 of PC Card Standard, Volume 2 - Electrical Specification excepting that the Uni-Directional Receiving Device and the POD SHALL only use 8-bit read and write modes.	HPIB HPIQ	A.5.5.11 4.13	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>PCMCIA Interface Initialization</b>					
HPPIi.1	The Uni-Directional Receiving Device SHALL execute a PCMCIA reset by bringing the RESET signal to the POD active.	HPIAI	6.7.1.3. 12.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPPIi.2	The Uni-Directional Receiving Device SHALL not route the MPEG data stream through the POD during PCMCIA reset or before personality change.	HPIA	6.7.1.3. 1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPPIi.4	The Uni-Directional Receiving Device SHALL begin the interface initialization when it has been powered, is in a steady state and a POD is inserted.	HPIA	6.7.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPPIi.5	The Uni-Directional Receiving Device SHALL begin the interface initialization when it has performed an internal reset operation for some reason that has not caused the POD to reset.	HPIA	6.7.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

HPPIi.10	Before personality change, the POD behaves as a memory-only device, and the Uni-Directional Receiving Device SHALL implement a memory-only device interface with the following restrictions: Signals D8~D15 SHALL remain in the high-impedance state. 16-bit read and write modes are not available. CE2# is ignored and interpreted by the POD as always being in the 'High' state. Before personality change the Uni-Directional Receiving Device SHALL not drive Address lines A14~A25.	HPIB	A.5.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPPIi.11	Before personality change the Uni-Directional Receiving Device SHALL have the pin assignments described in the table of section 6.1.3 of reference HPIA.	HPIA	6.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPPIi.13	The Uni-Directional Receiving Device SHALL have a 100k ohm pull-down resistor on the MCLKO signal to prevent invalid inband transport data from being received prior to the POD's personality change.	HPIA	6.7.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPPIi.14	Before personality change, the Uni-Directional Receiving Device SHALL utilize pins D7 – D0 as a byte oriented I/O port.	HPIA	6.1.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPPIi.15	Before personality change, the Uni-Directional Receiving Device SHALL have the capability to read the attribute memory.	HPIA	6.1.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>Personality Change Sequence</b>					
HPPcs.1	The Uni-Directional Receiving Device SHALL hold the RESET pin of the POD in a high-Z state for a minimum of 1 msec after VCC is valid. (Power up reset)	HPIA	6.7.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPPcs.2	When implementing a PCMCIA reset, the Uni-Directional Receiving Device SHALL hold the RESET signal active for a minimum of 10 usec.	HPIA	6.7.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPPcs.3	The Uni-Directional Receiving Device SHALL not test the POD's READY signal until after a minimum of 20 msec after RESET goes inactive	HPIA	6.7.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPPcs.4	The Uni-Directional Receiving Device SHALL not attempt to access the POD until the READY signal is active (logic 1).	HPIA	6.7.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPPcs.5	Once the POD has asserted READY, the Uni-Directional Receiving Device SHALL only communicate with the POD using the PC card memory interface.	HPIA	6.7.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPPcs.7	The Uni-Directional Receiving Device SHALL find the CIS in the attribute memory of the POD and it SHALL begin at address 000h and continue on even	HPIA	6.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M



	addresses (000h, 002h, 004h, etc.)				
HPPcs.8	The Uni-Directional Receiving Device SHALL read all the CCST_CIF subtuples to verify that the SCTE interface ID number (STCI_IFN) is present (341h)	HPIA	6.7.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPPcs.9	After identifying the POD as having interface ID number 341h, the Uni-Directional Receiving Device SHALL write the value read in the subtuple TPCE_INDXX into the Configuration Option Register (COR)	HPIA	6.7.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPPcs.10	The Uni-Directional Receiving Device SHALL use the COR structure shown in section 6.7.5 of reference HPIA.	HPIA	6.7.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPPcs.11	Following the write to the COR the Uni-Directional Receiving Device SHALL switch the address signals A4:A8 to the OOB interface signals and the inband transport stream signals. This switch over SHALL occur no later than 10µsec after the COR write occurs. A9 => DRX, A8 => CRX, A7 => QTX, A6 => ETX, A5 => ITX, A4 => CTX	HPIA	6.7.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPPcs.13	The Uni-Directional Receiving Device SHALL not begin upper layer initialization until the POD has set the FR bit in the status register.	HPIA	6.7.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>Error condition</b>					
HPinit.219	UNI-DIRECTIONAL RECEIVING DEVICE writes a '1' to the RS bit in the data channel Control/Status Register.	HP11	6.1.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPinit.220	After a minimum of 40 usec, the UNI-DIRECTIONAL RECEIVING DEVICE SHALL write a '0' to same location.	HP11	6.1.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPinit.221	UNI-DIRECTIONAL RECEIVING DEVICE writes a '1' to the RS bit in the extended channel Control/Status Register.	HP11	6.1.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPinit.222	After a minimum of 40 usec, the UNI-DIRECTIONAL RECEIVING DEVICE SHALL write a '0' to same location.	HP11	6.1.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPinit.223	Uni-Directional Receiving Device writes a '1' to the RS bit of the Control Register	HP11	A.2.2.1.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPinit.224	Uni-Directional Receiving Device writes '1' to the SR bit in the Control Register and waits for DA bit to be set.	HP1B	A.2.2.1.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPinit.225	The Uni-Directional Receiving Device SHALL read the POD module buffer size as a 2 byte value and then set SR bit to '0'	HP1B	A.2.2.1.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPinit.228	Uni-Directional Receiving Device resets SR bit to 0 Uni-Directional Receiving Device sets the SW bit to '0'	HP1B	A.2.2.1.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

HPinit.229	Uni-Directional Receiving Device writes '1' to the SR bit in the Control Register and waits for DA bit to be set.	HPIB	A.2.2.1.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPinit.234	Uni-Directional Receiving Device opens exactly one transport connection to POD using a T_C tag value of 82. Uni-Directional Receiving Device SHALL request to open transport connection by opening exactly one transport connection for each SCTE POD using Create_T_C_Tag = 0X82.	HP11	6.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPinit.235	Uni-Directional Receiving Device responds with open_session_response_tag = 0X92. And resource_identifier value of 0X00010041 and session_nb of YYYY 16 bit session number as created by Uni-Directional Receiving Device.	HP1A	8.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPinit.236	Uni-Directional Receiving Device Resource Manager sends a Profile Inquiry to POD with Profile_inq_tag value of 0X9F8010	HP11	6.4.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPinit.237	Uni-Directional Receiving Device sends a profile_changed APDU with profile_changed_tag value of 0X9F8012	HP11	6.4.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPinit.238	Uni-Directional Receiving Device then replies with profile_reply_tag value of 0X9F8011 and XXXXXXXX 32 bit resource_identifier.	HP11	6.4.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPinit.239	Uni-Directional Receiving Device responds with open_session_response_tag value of 0X92, a resource_identifier value of 0X0020081 and a session_nb YYYY 16 bit unique identifier.	HP11	6.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HPinit.240	Uni-Directional Receiving Device then sends an Application Info Inquiry to the POD with application_info_inq_tag value of 0X9F8020	HP11	6.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

### 3.3 Data Channel Protocol

Item	Feature	Spec	Ref	Support	Status
<b>Application Layer - Host Control</b>					
DAPhc.1	The Uni-Directional Receiving Device SHALL provide the Host Control Resource.	HPIB	8.5.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPhc.2	The Uni-Directional Receiving Device SHALL support one Host Control Resource session .	HPIB HP1A	8.5.1 8.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

DAPHC.30	The Uni-Directional Receiving Device, after the requested OOB frequency has been tuned and acquired ("tune time") or 500msec has elapsed since receiving the Request (whichever comes first), SHALL respond with the oob_rx_tune_cnf APDU to the oob_rx_tune_req.	HPIA	8.8.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPHC.31	The oob_rx_tune_cnf object SHALL have the structure described in section 8.8.2 of reference HPIA. Allowable values of status_field in the oob_rx_tune_cnf object SHALL be:  Tuning granted (00) Tuning denied – Rf rx not physically available (01) Tuning denied – rf rx busy (02) Tuning denied – invalid parameters (03) Tuning denied – other reasons (04)	HPIA	8.8.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPHC.3	The Uni-Directional Receiving Device SHALL respond to an oob_rx_tune_req with an RF_RX_frequency_value outside the range of 70 MHz to 130 MHz, with the oob_rx_tune_cnf APDU and status_field set to Tuning Denied.	HPIA	8.8.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	The POD will set the modulation_value in inband_tune_req to one of the following values: 64 QAM (00), 256 QAM (01)	HPIA	8.8.3		I
DAPHC.32	After receiving the inband_tune_req, the Uni-Directional Receiving Device SHALL respond with the inband_tuning_cnf object. The structure of this object is detailed in the table 8.8-R of section 8.8.4	HPIA	8.8.4	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPHC.33	The inband_tuning_cnf object SHALL have the structure described in section 8.8.4 of reference HPIA. The allowable tune_status value in the inband_tuning_cnf APDU SHALL contain one of the following values: Tuning accepted (00) Invalid frequency (01) Invalid modulation (02) Hardware failure (03) Tuner busy (04)	HPIA	8.8.4	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

### 3.4 Other Requirements of a Uni-directional Receiving Device

Item	Feature	Spec	Ref	Support	Status
UniDir.1	For UDRDs sold or marketed after July 1, 2005, conducted emissions (including LO and spurious) at the RF input SHALL be less than or equal to -30 dBmV over the range 54 MHz to 864 MHz and -26 dBmV over the range 5 MHz up to but not including 54 MHz, measured with a 9 kHz bandwidth.	Appendix A	R-4	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
UniDir.3	The Uni-Directional Receiving Device SHALL respond to the OOB_TX_tune_req with a OOB_TX_tune_cnf with the Status_field set to (0x01) Tuning Denied - RF Transmitter not physically available	HP1A	8.8.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

### 3.5 Physical Interface

Item	Feature	Spec	Ref	Support	Status
	Invalid session APDU from POD.	HP1I	APPENDIX B-57		I
HPinit.291	Uni-Directional Receiving Device ignores invalid sessions.	HP1I	APPENDIX B-57	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	Invalid SPDU tag from POD.	HP1I	APPENDIX B-59		I
HPinit.292	Uni-Directional Receiving Device ignores invalid SPDU tags.	HP1I	APPENDIX B-59	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	Invalid APDU tag from POD.	HP1I	APPENDIX B-61		I
HPinit.293	Uni-Directional Receiving Device ignores invalid APDU tags.	HP1I	APPENDIX B-61	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	Uni-Directional Receiving Device has not created Transport ID from POD.	HP1I	APPENDIX B-63		I
HPinit.294	Uni-Directional Receiving Device ignores transport ID's that have not been created.	HP1I	APPENDIX B-63	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	Session ID from POD that has not been created by Uni-Directional Receiving Device.	HP1I	APPENDIX B-65		I

HPinit.295	Uni-Directional Receiving Device ignores session ID's that have not been created.	HP11	APPENDIX B-65	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	POD READY signal does not go active.	HP1A	APPENDIX E		I
HPinit.248	For the above error, Uni-Directional Receiving Device either 1) reports error using screen in figure (figure E-1), 2) retry up to two times and then report error using screen in figure (figure E-1), or 3) report error but continue to perform PCMCIA resets	HP1A	APPENDIX E	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	POD has incorrect CIS values	HP1A	APPENDIX E		I
HPinit.249	For the above error, Uni-Directional Receiving Device reports error using screen in figure E.1-1 Error Display	HP1A	APPENDIX E	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	Uni-Directional Receiving Device sets data channel RS bit but POD fails to set FR bit within 5 second timeout.		APPENDIX B-4		I
HPinit.250	For the above error, Uni-Directional Receiving Device either 1) reports error using screen in figure Figure E.1-1 Error Display 2) retry up to two times and then report error using screen in figure Figure E.1-1 Error Display, or 3) reports error and continue to perform PCMCIA resets	HP1A	APPENDIX E	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	Uni-Directional Receiving Device sets extended channel RS bit but POD fails to set FR bit within 5-second timeout.	HP11	APPENDIX B-5		I
HPinit.251	For the above error, Uni-Directional Receiving Device either 1) reports error using screen in figure Figure E.1-1 Error Display 2) retry up to two times and then report error using screen in figure Figure E.1-1 Error Display, or 3) reports error and continue to perform PCMCIA resets	HP1A	APPENDIX E	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	Invalid buffer negotiation – POD data channel (buffer size < 16).	HP11	APPENDIX B-6		I
HPinit.252	For the above error, Uni-Directional Receiving Device either 1) reports error using screen in figure Figure E.1-1 Error Display 2) retry up to two times and then report error using screen in figure Figure E.1-1 Error Display, or 3) operate with smaller size	HP1A	APPENDIX E	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

	In valid buffer negotiation – POD extended channel (buffer size < 16).	<b>HPIA</b>	APPENDIX E		I
HPinit.254	For the above error, Uni-Directional Receiving Device either 1) reports error using screen in figure Figure E.1-1 Error Display 2) retry up to two times and then report error using screen in figure Figure E.1-1 Error Display, or 3) operate with smaller size	<b>HPIA</b>	APPENDIX E	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	POD does not respond to Uni-Directional Receiving Device open transport request. within 5 seconds	<b>HPIA</b>	APPENDIX E		I
HPinit.255	For the above error, Uni-Directional Receiving Device either 1) reports error using screen in figure Figure E.1-1 Error Display 2) retry up to two times and then report error using screen in figure Figure E.1-1 Error Display, or 3) reports error and continue to perform PCMCIA resets	<b>HPIA</b>	APPENDIX E	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	POD fails to respond to profile_inq within 5 seconds.	<b>HPIA</b>	APPENDIX E		I
HPinit.262	For the above error, Uni-Directional Receiving Device either 1) reports error using screen in figure Figure E.1-1 Error Display 2) retry up to two times and then report error using screen in figure Figure E.1-1 Error Display, or 3) reports error and continue to perform PCMCIA resets	<b>HPIA</b>	APPENDIX E	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	POD fails to respond to ca_info_inq within 5 seconds.	<b>HPIA</b>	APPENDIX E		I
HPinit.279	For the above error, Uni-Directional Receiving Device either 1) reports error using screen in figure Figure E.1-1 Error Display 2) retry up to two times and then report error using screen in figure Figure E.1-1 Error Display, or 3) reports error and continue to perform PCMCIA resets	<b>HPIA</b>	APPENDIX E	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	Write Error (WE) occurs after completion of any transfer from Uni-Directional Receiving Device to POD.	<b>HPIA</b>	APPENDIX E		I
HPinit.288	Uni-Directional Receiving Device performs POD reset.	<b>HPIA</b>	APPENDIX E	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	Read Error (RE) occurs after completion of any transfer from POD to Uni-Directional Receiving Device.	<b>HPIA</b>	APPENDIX E		I
HPinit.289	Uni-Directional Receiving Device performs POD reset	<b>HPIA</b>	APPENDIX E	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

	POD fails to respond to any request other than described above by HPinit.262 or HPinit.279 within 5 seconds.	HPIA	APPEN DIX E		I
HPinit.290	Uni-Directional Receiving Device performs POD reset up to two times and then reports error using screen in figure Figure E.1-1 Error Display.	HPIA	APPEN DIX E	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

### 3.6 Data Channel Protocol

Item	Feature	Spec	Ref	Support	Status
<b>Physical</b>					
DPh.44	The Uni-Directional Receiving Device SHALL reset the interface for both channels when the Uni-Directional Receiving Device sets the RS_flag on either the Extended Channel or Data Channel.	HPIA	6.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DPh.45	When IREQ# is asserted, the Uni-Directional Receiving Device SHALL first check the data channel, and then the extended channel to determine the source of the interrupt.	HPIA	6.5.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DPh.55	After POD Personality Change, the Uni-Directional Receiving Device SHALL do buffer negotiation with the POD for both Data Channel and the Extended Channel.	HPIB	A.2.2.1. 1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DPh.56	The Uni-Directional Receiving Device SHALL reset the interface by writing 1 to the RS bit in the Control Register if there is an error during initialization.	HPIB	A.2.2.1. 1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DPh.58	The Uni-Directional Receiving Device SHALL not use the interface for transferring data until buffer negotiation has been done.	HPIB	A.2.2.1. 1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DPh.60	The Uni-Directional Receiving Device SHALL provide a buffer of at least 256 bytes.	HPIB	A.2.2.1. 1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DPh.62	The Uni-Directional Receiving Device SHALL use the smaller of its own buffer size and the POD buffer size.	HPIB	A.2.2.1. 1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DPh.63	The Uni-Directional Receiving Device SHALL tell the POD the negotiated buffer size.	HPIB	A.2.2.1. 1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>Link Layer – Data Channel</b>					
DLk.1	The Uni-Directional Receiving Device SHALL construct a LPDU that fragments Transport Protocol Data Units (TPDU), if necessary, for sending over the limited buffer size of the Physical Layer, and reassembles received fragments	HPIB	A.3.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

DLk.3	The Uni-Directional Receiving Device SHALL construct a LPDU with a size that is less than or equal to the negotiated buffer size	HPIB	A.3.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DLk.4	The first byte of the LPDU SHALL be the Transport Connection ID. The second byte SHALL be:  MSB: 1 indicates there is at least one more TPDU fragment to follow.  MSB: 0 indicates that this is the last Fragment, for that Transport Connection  Remaining 7 bits: Reserved, Set to zero.	HPIB	A.3.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DLk.6	The Uni-Directional Receiving Device SHALL start each TPDU in a new LPDU (the last fragment of the previous TPDU on a Transport Connection cannot also carry the first fragment of the next one).	HPIB	A.3.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>Transport Layer</b>					
DTp.45	The Uni-Directional Receiving Device SHALL not use Transport Identifier 0.	HPIB	7.1.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DTp.2	The Uni-Directional Receiving Device SHALL open exactly one transport connection, using Create_T_C(), with the POD..	HPIA  HPIB	6.7.6.3 A.4.1.4	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DTp.3	The Uni-Directional Receiving Device SHALL wait for an C_T_C_Reply() response from the POD.	HPIB	A.4.1.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DTp.7	TPDU chaining SHALL not be used.	HPIA	6.7.6.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DTp.8	The largest LPDU SHALL be no larger than the negotiated buffer size.	HPIA	6.7.6.3 6.7.6.1. 3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DTp.11	In order to delete an existing Transport Connection, the Uni-Directional Receiving Device SHALL issue a Delete_T_C.	HPIB	7.1.2 A.4.1.6	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DTp.12	If The Uni-Directional Receiving Device receives a Delete_T_C, it SHALL issue a D_T_C_Reply to the POD indicating that it received the Delete_T_C. D_T_C_Reply has the structure shown in the table A.4.7	HPIB	7.1.2 A.4.1.7	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DTp.13	When the Uni-Directional Receiving Device has sent a Delete_T_C and is waiting for a D_T_C_Reply it SHALL wait until a time out occurs ora D_T_C_Reply is received. If the time-out matures before the reply is received then the Uni-Directional Receiving Device SHALL proceed as if a D_T_C_Reply had been received.	HPIB	7.1.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M



DTp.19	If the Uni-Directional Receiving Device receives a T_SB, and the DA bit = 1 in the sb_value field of the T_SB, it SHALL issue T_RCV to request the data the POD wishes to send to the Uni-Directional Receiving Device.	HPIB	7.1.2(8) & 7.1.2(9) A.4.1.11.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DTp.47	The Uni-Directional Receiving Device SHALL use T_Data_Last when a PDU from a higher layer has to be split into fragments for sending due to external constraints on the size of data transfers. It indicates the last or only fragment of the upper layer PDU.	HPIB	7.1.2 A.4.1.11	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DTp.21	The Uni-Directional Receiving Device SHALL poll at a period not greater than 100ms by issuing a C_TPDU with length L equal to 1. This polling allows the POD to inform the Uni-Directional Receiving Device of any data available.	HPIB	A.4.1.12	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DTp.23	The Uni-Directional Receiving Device SHALL issue one or more C_TPDU until the DA indicator is set to 0 again.	HPIB	A.4.1.12	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DTp.24	The Uni-Directional Receiving Device SHALL suspend the poll function during data transfer with DA set.	HPIB	A.4.1.12	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DTp.25	The Uni-Directional Receiving Device SHALL restart polling after DA is reset.	HPIB	A.4.1.12	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DTp.27	The Uni-Directional Receiving Device SHALL start a timeout of 5 seconds with each poll. If no poll response has been received within that time, the transport connection shall be deleted by the Uni-Directional Receiving Device.	HPIB	A.4.1.12	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DTp.28	The Uni-Directional Receiving Device SHALL send a Create_T_C when it wishes to set up a transport connection with the POD, and moves to 'In Creation' state.	HPIB	7.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	The POD will reply directly with a C_T_C_Reply upon receipt of Create_T_C.	HPIB	7.1.3		I
DTp.30	Upon receiving a C_T_C_Reply the Uni-Directional Receiving Device SHALL move to the 'Active State'.	HPIB	7.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DTp.31	The Uni-Directional Receiving Device SHALL not transmit or poll again on that particular transport connection if the module does not respond within 5 s. The Uni-Directional Receiving Device SHALL return to the 'Idle State'.	HPIB	7.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DTp.48	The Uni-Directional Receiving Device SHALL ignore a late C_T_C_Reply	HPIB	7.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

DTp.32	The Uni-Directional Receiving Device SHALL send a Delete_T_C when it wishes to terminate the transport connection, and moves to the 'In Deletion State'.	HPIB	7.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	The POD will reply with a D_T_C_Reply upon receipt of Delete_T_C.	HPIB	7.1.3		I
DTp.34	The Uni-Directional Receiving Device SHALL return to the 'Idle State' from 'Deletion State' upon receipt of a D_T_C_Reply object, or after a time-out of 5 s if none is received.	HPIB	7.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DTp.35	If the Uni-Directional Receiving Device (in 'Active State') receives a Delete_T_C object from the POD it issues a D_T_C_Reply object and goes directly to the idle state.	HPIB	7.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DTp.36	Except for the 'Active State', the Uni-Directional Receiving Device SHALL ignore any object received in any state that is not expected.	HPIB	7.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DTp.37	In the 'Active State' the Uni-Directional Receiving Device SHALL issue polls at least every 100ms, or send data if it has an upper-layer PDU to send.	HPIB	7.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DTp.49	The Uni-Directional Receiving Device SHALL be capable of sending data at any time while in the 'Active state'.	HPIB	7.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	In response to polling the POD will reply with T_SB, or T_SB preceded by a Request_T_C or Delete_T_C.	HPIB	7.1.3		I
	If the POD wishes to send data it will wait for a message from the Uni-Directional Receiving Device and then indicate that it has data available in the T_SB reply.	HPIB	7.1.3		I
DTp.40	Once the Uni-Directional Receiving Device has received a T_SB with a DA bit = 1 in the sb_value field, the Uni-Directional Receiving Device SHALL then at some point - not necessarily immediately - send a T_RCV request to the POD.	HPIB	7.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	The POD responds by sending the waiting data in a T_Data (T_Data_Last or T_Data_More object).	HPIB	7.1.3		I
DTp.41	When the Uni-Directional Receiving Device receives a T_Data object with a T_Data_More, it SHALL send a T_RCV to the POD to receive the remaining data.	HPIB	7.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>Session Layer</b>					
DSs.1	The Uni-Directional Receiving Device SHALL have a session layer that uses a Session Protocol Data Unit (SPDU) structure to exchange data at session level between the Uni-Directional Receiving Device and the POD.	HPIB	7.2.4	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

DSs.2	The Uni-Directional Receiving Device SHALL implement a SPDU that has the structure shown in section 7.2.4	HPIB	7.2.4	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DSs.3	The Uni-Directional Receiving Device SHALL transport a SPDU in the data field of one or several TPDUs.	HPIB	7.2.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	The POD issues open_session_request to the Uni-Directional Receiving Device in order to request the opening of a session between the POD and one resource provided either by the Uni-Directional Receiving Device or by a POD. open_session_request has the structure shown in the section 7.2.6.1	HPIB	7.2.6.1		I
DSs.7	If the version field of the supplied resource identifier is zero, the Uni-Directional Receiving Device SHALL use the current version in its list.  If the version number is less than or equal to the current version number in the Uni-Directional Receiving Device 's list then the current version is used.  If the requested version number is higher than the version in the Uni-Directional Receiving Device 's list, then the Uni-Directional Receiving Device will refuse the request with the appropriate return code.	HPIB	7.2.6.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DSs.8	The Uni-Directional Receiving Device SHALL respond to an open_session_request with an open_session_response as defined in section 7.2.6.2.	HPIB	7.2.6.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DSs.9	The Uni-Directional Receiving Device SHALL respond to a open_session_request with a open_session_response. Valid session_status values in open_session_request SHALL be:  'Session is opened' (00), 'Session not opened, resource non-existent' (F0), 'Session not opened, resource exists but unavailable' (F1), 'Session not opened, resource exists but version lower than requested' (F2), 'Session not opened, resource busy' (F3),	HPIB	7.2.6.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DSs.10	The Uni-Directional Receiving Device SHALL return the actual resource_identifier of the resource requested, with the current version number.	HPIB	7.2.6.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

DSs.19	When the response is resource_non_existent the Uni-Directional Receiving Device SHALL respond with the resource_identifier field identical to that supplied in the open request.	HPIB	7.2.6.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DSs.11	The Uni-Directional Receiving Device SHALL allocate a session number for the requested session (session_nb). Session_nb will be used for all subsequent exchanges of APDU's between the POD and the resource until the session is closed.	HPIB	7.2.6.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DSs.14	The Uni-Directional Receiving Device SHALL issue a close_session_request object to close a session. close_session_request has the structure shown in the section 7 table 10.	HPIB	7.2.6.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DSs.15	When the Uni-Directional Receiving Device has received a close_session_request it SHALL respond with a close_session_response to acknowledge the closing of the session. close_session_response has the structure shown in the section 7 table 11.	HPIB	7.2.6.6	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DSs.16	The session_status field in the close_session_response object SHALL be one of the following: 'session is closed as required' (00); 'session_nb in the request is not allocated' (F0).	HPIB	7.2.6.6	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DSs.17	The session_number object SHALL always precede a body of the SPDU containing APDU. Session number has the structure shown in the section 7 table 13.	HPIB	7.2.6.7	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DSs.18	The Uni-Directional Receiving Device SHALL use the names of the objects and the tag values as outlined in section 3.1 reference HPIA	HPIA	3.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>Application Layer-General</b>					
DAPGn.1	The Uni-Directional Receiving Device SHALL provide the Resource Manager resource.  NOTE: Resource Manager specific PICS are located in section DAPRm Application Layer – Resource Manager	HPIA HPIB	8.2 8.4.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPGn.2	The Uni-Directional Receiving Device SHALL provide the Man Machine Interface resource (MMI).  NOTE: This is covered in more detail in section DAPMi – Application Layer - MMI	HPIA	8.3.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

DAPGn.3	The Uni-Directional Receiving Device SHALL provide support for Application Info resource  NOTE: Application Info resource PICS are located in section DAPAi – Application Layer – Application Information	HPIA	8.4.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPGn.5	The Uni-Directional Receiving Device SHALL provide the Conditional Access Support resource.  NOTE: Conditional Access Support resource PICS are located in section DAPCa – Application Layer – Conditional Access Support	HPIA	8.6	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPGn.7	The Uni-Directional Receiving Device SHALL provide the Copy Protection resource.  NOTE: Uni-Directional Receiving Device Copy Protection PICS are located in section 3.9 Copy Protection Support	HPIN	8	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPGn.8	The Uni-Directional Receiving Device SHALL provide the Host Control resource.  NOTE: Uni-Directional Receiving Device Host Control resource PICS are located in section DAPHc – Application Layer – Host Control	HPIA	8.8	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPGn.9	The Uni-Directional Receiving Device SHALL provide version 1 of the Extended Channel Support resource.  NOTE: Extended Channel Support resource PICS are located in section ExchF – Application Layer – Extended Channel Support	HPIA	8.9	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPGn.13	The Uni-Directional Receiving Device SHALL provide support for the POD Homing Resource.  NOTE: POD Module Homing resource PICS are located in section DAPHm – Application Layer – DAPHm	HPIA	8.13.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPGn.14	The Uni-Directional Receiving Device SHALL provide support for the System Time resource.  NOTE: System Time resource PICS are located in section DAPSt – Application Layer – System Time	HPIB	8.5.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	The Uni-Directional Receiving Device resources are identified in section 8.1 for the resources the Uni-Directional Receiving Device supports.	HPIA	8.1		I

DAPGn.16	For all protocols in the application layer the Uni-Directional Receiving Device SHALL use the common Application Protocol Data Unit (APDU) structure to send application data between the POD and the Uni-Directional Receiving Device. APDU has the structure shown in the table 16.	HPIB	8.3.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPGn.18	Only a single APDU SHALL be supported in the body of an SPDU.	HPIA	Table 3.1-A item 10	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>Application Layer - Resource Manager</b>					
DAPRm.1	The Uni-Directional Receiving Device SHALL support at least 32 sessions of the resource manager.	HPIB, HPIA'	8.4.1; 8.2, Table 8-1.B	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPRm.2	The Uni-Directional Receiving Device SHALL support Resource Manager resource ID 0x00010041 (class 1, type 1, version 1)	HPIA	Table 8.1-A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPRm.3	When the Uni-Directional Receiving Device powers-up or the POD is plugged-in, the Uni-Directional Receiving Device SHALL create exactly one transport connection to the POD.	HPIA	Table 8.1-B	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPRm.4	After opening the session for the resource manager, the Uni-Directional Receiving Device SHALL send a profile_inq() to the application or resource provider. profile_inq() has the structure shown in the table 6.7-E	HPIA	6.7.6.4.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	The application or resource will wait for profile_changed(). While waiting it can neither create sessions to other resources nor can it accept sessions from other applications.	HPIA	6.7.6.4.2		I
DAPRm.8	Once the Uni-Directional Receiving Device has built its resource list it SHALL send a profile_changed() object on all current resource manager sessions. profile_changed() has the structure shown in the table 6.7-G.	HPIA	6.7.6.4.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPRm.10	When asked by the POD the Uni-Directional Receiving Device SHALL send a profile_reply() object with the Uni-Directional Receiving Device 's list of available resources. profile_reply() has the structure shown in the table 6.7-F.	HPIA	6.7.6.4.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>Application Layer – MMI</b>					
DAPMi.1	The Uni-Directional Receiving Device SHALL provide the Man Machine Interface Resource: MMI, class 64, Type 2, Version 1, Identifier 0x000400081.	HPIA	8.3.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

DapMi.12	The Uni-Directional Receiving Device SHALL provide a navigation method to allow user navigation with the MMI resource defined in reference HPIA	HPIA	8.3.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DapMi.2	The Uni-Directional Receiving Device SHALL be capable of processing the open_mmi_req() APDU from the POD. Open_mmi_req() has the syntax shown in section 8.3.2.1 of HPIA	HPIA	8.3.2.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	For Uni-Directional Receiving Devices that support more than one MMI dialog at the same time, the POD can send another open_mmi_req() before it closes the previous one.	HPIA	8.3.2.1		I
DapMi.3	<p>The Uni-Directional Receiving Device MAY implement the following displays found in the display_type values:</p> <p>0: Full screen 1: Overlay 2: New window</p> <p>Note that the UDRD indicates to the POD which Display Types</p>	HPIA	8.3.2.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	C-M
DapMi.4	The Uni-Directional Receiving Device SHALL reply to an open_mmi_req() with an open_mmi_cnf() to confirm the status of the request. Open_mmi_cnf() has the syntax found in section 8.3.2.2 of HPIA	HPIA	8.3.2.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DapMi.5	<p>The Uni-Directional Receiving Device SHALL respond to a open_mmi_req() APDU with a open_status field of the open_mmi_cnf() APDU:</p> <p>00: OK – Dialog opened 01: Request denied – Uni-Directional Receiving Device busy 02: Request denied – Display type not supported 03: Request denied – no video signal 04: Request denied – no more windows available</p>	HPIA	8.3.2.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DapMi.6	The Uni-Directional Receiving Device SHALL issue a dialog_number from an eight-bit cyclic counter that identifies each open_mmi_cnf() APDU and allows the POD to close the MMI dialog.	HPIA	8.3.2.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DapMi.7	The Uni-Directional Receiving Device SHALL reply to a close_mmi_req with a close_mmi_cnf() to report the status of the close operation, with the syntax found in section 8.3.3 of reference HPIA.	HPIA	8.3.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

DapMi.10	The Uni-Directional Receiving Device SHALL respond to a close_mmi_req() ADPU with a close_status field of the close_mmi_cnf() APDU:  0: dialog closed by POD 1: dialog closed by Uni-Directional Receiving Device 2: dialog not closed	HPIA	8.3.3.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DapMi.11	Under the Baseline HTML Profile all text in the MMI message must be visible on the screen		Appendix C.1.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DapMi.13	If the Host adds navigation buttons around the MMI screen, those buttons SHALL NOT obscure any MMI text.		Appendix C.1.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	C-M
DapMi.14	Under the Baseline HTML Profile the Uni-Directional Receiving Device Windows SHALL be opaque.		Appendix C.1.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DapMi.15	Under the Baseline HTML Profile the Uni-Directional Receiving Device SHALL support minimum of 32 characters per line and a minimum of 16 lines of characters in a window without vertical and horizontal scrolling. The vertical height of the characters SHALL be approximately 1/18 of the screen height.		Appendix C.1.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	C-M
DapMi.16	Under the Baseline HTML Profile, the UDRD MAY render text and background colors as requested in the HTML data from the POD. If the HTML data does not include a text and/or background color command, or the UDRD does not support the text and/or background color command, the Host SHALL use either: 1) black text on a light gray background 2) or white text on a black background.		Appendix C.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DapMi.18	If the Uni-Directional Receiving Device supports either the background color or text color command then it SHALL support both of the commands. It SHALL not support only one of the commands.		Appendix C.1.4	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	C-M
DapMi.19	Under the Baseline HTML Profile, the Uni-Directional Receiving Device MAY render the unvisited link color as requested in the HTML data from the POD. If the HTML data does not include an unvisited link color command, or the Uni-Directional Receiving Device does not support the unvisited link color command, the Host SHALL use blue .		Appendix C.1.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	C-M



DapMi.20	Under the Baseline HTML Profile, the Uni-Directional Receiving Device MAY align paragraphs as requested by the HTML data from the POD. If the HTML data does not include a paragraph alignment command, or the Uni-Directional Receiving Device does not support the paragraph alignment command, the Host SHALL use a LEFT paragraph alignment.		Appendix C.1.6	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	C-M
DapMi.24	The Baseline HTML Profile does not define how a hyperlink is navigated and selected. The Uni-Directional Receiving Device SHALL provide some navigation/selection mechanism to identify the user intention and forward the selected link to the POD module using the server_query APDU.		Appendix C.2.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DapMi.25	The Uni-Directional Receiving Device SHALL implement all required HTML Keywords in Appendix C.3.		Appendix C.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DapMi.26	The Uni-Directional Receiving Device SHALL recognize and display all Characters in Appendix C.4		Appendix C.4	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DapMi.31a	The Uni-Directional Receiving Device Shall not be adversely affected by any optional HTML elements implemented by the POD as defined in Appendix C of HPIA.	HPIA	Appendix C	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>Application Layer - Application Information</b>					
DAPAi.1	Application Information resource (ID 0x00020081, class 2, type 2, version 1) SHALL be provided by the Uni-Directional Receiving Device	HPIB, HPIA	8.4.2, 8.4.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPAi.13	The Uni-Directional Receiving Device SHALL not close the Application Information resource session during normal operation	HPIA	8.4.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPAi.5	Once the Application Information resource session is opened, Uni-Directional Receiving Device SHALL send the Application_info_req() APDU to the POD to advertise its display capabilities. Application_info_req() has the structure shown in section 8.4.2.1 of HPIA	HPIA	8.4.2.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPAi.30	If the Uni-Directional Receiving Device supports the Full Screen Window Type and if that Window Type is requested by the POD via the open_mmi_req() APDU the UDRD SHALL present the MMI dialog in an opaque window.	HPIA	8.4.2.1		C-M

DAPAi.31	If the Uni-Directional Receiving Device supports the Overlay Window Type and if that Window Type is requested by the POD via the open_mmi_req() APDU the UDRD SHALL present the MMI dialog in an opaque window which is large enough to contain the MMI message but does not fill the entire viewable area.	HPIA	8.4.2.1		C-M
DAPAi.32	If the Uni-Directional Receiving Device supports the Multiple Windows Type and if that Window Type is requested by the POD via the open_mmi_req() APDU the UDRD SHALL present each subsequent MMI dialog, up to the maximum number conveyed, in an Overlay Window. The Uni-Directional Receiving Device SHALL support a method for navigating between the different windows.	HPIA	8.4.2.1		C-M
DAPAi.33	The Uni-Directional Receiving Device SHALL support at a minimum the Baseline HTML Profile. The Baseline HTML Profile is defined in Appendix C of HPIA, except that 480i displays SHALL have a minimum resolution of 32 characters X 16 lines.	HPIA	8.4.2.1		M
DAPAi.14	The Uni-Directional Receiving Device SHALL process the application_info_cnf() APDU when received. The syntax of this APDU is shown in section 8.4.2.2 of HPIA	HPIA	8.4.2.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPAi.7	Upon reception of a Application_info_cnf APDU from the POD, the Uni-Directional Receiving Device SHALL report which of the following application types are available to the user: Conditional Access (00), Copy Protection (01),  Network Interface- DVS 167 (03), Network Interface – DVS 178 (04),	HPIA	8.4.2.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPAi.15	The Uni-Directional Receiving Device SHALL send a server_query() APDU when required to the POD to request the information in the POD file server system pointed by a specific URL.	HPIA	8.4.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	The POD locates the requested data and provides it back to the Uni-Directional Receiving Device in the server_reply() APDU.	HPIA	8.4.3		I
DAPAi.16	The Uni-Directional Receiving Device SHALL process and display the data returned in the server_reply() APDU in a timely manner.	HPIA	8.4.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

DAPai.17	When the Uni-Directional Receiving Device transmits a <code>server_query()</code> APDU, it SHALL comply with the syntax described in section 8.4.3.1 of HPIA.	HPIA	8.4.3.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	C-M
DAPai.18	A Uni-Directional Receiving Device not supporting headers SHALL set the <code>header_length</code> field of the <code>server_query()</code> APDU to zero.	HPIA	8.4.3.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	C-M
	After receiving a <code>server_reply</code> from the POD, the Uni-Directional Receiving Device can send data to the POD using a <code>server_query</code> APDU.	HPIA	8.4.3.2		I
	When the Uni-Directional Receiving Device is sending data to the POD after receiving a <code>server_reply</code> the last part of the URL contains a list of name-value pairs separated by "&"s. This list is preceded by a "?" and is illustrated in section 8.4.3.2 of HPIA.	HPIA	8.4.3.2		I
DAPai.21	The Uni-Directional Receiving Device SHALL support the <code>server_reply()</code> APDU having the syntax described in section 8.4.3.2 of reference HPIA.	HPIA	8.4.3.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPai.22	In the <code>server_reply()</code> APDU, the Uni-Directional Receiving Device SHALL treat a <code>header_length</code> field of zero as indication that the POD does not support headers.	HPIA	8.4.3.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>Application Layer - Conditional Access Support</b>					
DAPCa.1	The Uni-Directional Receiving Device SHALL provide the Conditional Access Support Resource id = 0x00030042 (class 3, type 1, version 2).	HPIB HPIA	8.4.3 8.6	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPCa.2	The Uni-Directional Receiving Device SHALL support one active Conditional Access Support resource	HPIB, HPIA;	8.4.3, 8.6	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPCa.5	Once a session to the Conditional Access Support resource is opened, the Uni-Directional Receiving Device SHALL send <code>ca_info_inq()</code> . <code>ca_info_inq()</code> has structure shown in the table 23.	HPIB	8.4.3.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPCa.7	The Uni-Directional Receiving Device SHALL send <code>CA_PMT</code> to the connected CA application in order to indicate which elementary stream is selected by the user and how to find the corresponding ECM.	HPIB	8.4.3.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

DApCa.10	The Uni-Directional Receiving Device SHALL send a new CA_PMT or a new list of CA_PMT when <ul style="list-style-type: none"> <li>- the user selects another program</li> <li>- a 'tune' command selects another service</li> <li>- the version_number changes</li> <li>- the current_next_indicator changes</li> </ul> The Unidirectional Receiving Device SHALL construct the ca_pmt() APDU structure as shown in the table 25.	HPIB	8.4.3.4	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DApCa.11	The Uni-Directional Receiving Device SHALL use the following ca_pmt_list_management values in ca_pmt(): more(00), first(01), last(02), only(03), add(04), update(05). Reserved (other values) The Uni-Directional Receiving Device SHALL interpret these values as described in reference HPIB 8.4.3.4.	HPIB	8.4.3.4	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DApCa.12	The Uni-Directional Receiving Device SHALL use the following ca_pmt_cmd_id values in ca_pmt():ok_descrambling(01), ok_mmi(02), query(03), not_selected(04) RFU (other values).	HPIB	8.4.3.4	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DApCa.22	When the POD firsts receives ca_pmt_cmd_id = "ok_mmi" it MAY begin a MMI dialog but SHALL not begin descrambling until receiving another CA_PMT object with the ca_pmt_cmd_id = "ok_descrambling". In this case the Uni-Directional Receiving Device SHALL guarantee that a MMI session can be opened by the CA application.	HPIB	8.4.3.4	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>Application Layer - System Time</b>					
DApSt.1	The Uni-Directional Receiving Device SHALL provide a system time resource id 0x00240041 (class 36, type 1, version 1).	HPIB	8.5.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DApSt.2	The Uni-Directional Receiving Device SHALL support one system time resource session.	HPIA	8.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DApSt.6	In response to system_time_inq(),if response_interval is zero, then the Uni-Directional Receiving Device SHALL reply with a single system_time() immediately.	HPIB	8.5.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

DAPSt.7	In response to system_time_inq(), if response_interval is non-zero then the Uni-Directional Receiving Device SHALL respond with a system_time() immediately, followed by further system_time() objects every response_interval seconds.	HPIB	8.5.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPSt.8	The Unidirectional Receiving Device SHALL construct the system_time() APDU structure as shown in Table 32	HPIB	8.5.2.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

### 3.7 Homing

DapHm.1	The Unidirectional Receiving Device SHALL provide the Homing resource id 0x00110042 (class 17, type 1, version 2).	HPIA	Table 8.13-A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPHm.2	The Unidirectional Receiving Device SHALL provide an "immediate" mode of Homing.	HPIA	8.13.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DapHm.2a	The Unidirectional Receiving Device SHALL provide a "delayed" mode of Homing.	HPIA	8.13.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	The POD module will open the Homing resource when it requires a firmware upgrade or requires a service.	HPIA	8.13.1		I
DAPHm.4	When the Open Homing Resource session is open, the unidirectional Receiving Device SHALL send open_homing() to the POD when it enters the standby state, either from power up or from user action. It SHALL send this independent of whether the Unidirectional Receiving Device Host Control resource has a session active.	HPIA	8.13.3.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPHm.5	The Unidirectional Receiving Device SHALL send the open_homing() APDU with the structure shown in table 8.13-C	HPIA	3.13.3.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	The POD will send open_homing_reply() to the Unidirectional Receiving Device to acknowledge receipt of the open_homing().	HPIA	8.13.3.3		I
	open_homing_reply() has the structure shown in the table 8.13-D.	HPIA	8.13.3.3		I
DAPHm.8	The Unidirectional Receiving Device SHALL send homing_active() to the POD to inform that the homing request has been activated. NOTE: This should be a response to the open_Homing_reply APDU.	HPIA	8.13.3.4	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPHm.9	The Unidirectional Receiving Device SHALL send homing_active() with the structure shown in the table 8.13-E of section 8.13. 3.4.	HPIA	8.13.3.4	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DAPHm.10	If the Unidirectional Receiving Device has not yet received the firmware_upgrade APDU, then it SHALL have the capability	HPIA	8.13.3.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

	to close the homing state, which is achieved by sending homing_cancelled() to the POD.				
DpHm.1 1	The Unidirectional Receiving Device SHALL send homing_cancelled() with the structure shown in the table 8.13-F of section 8.13.3.5.	HPIA	8.13.3.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	When the POD no longer needs the homing function, then it can transmit a homing_complete() to the Unidirectional Receiving Device. The POD can close the session or not.	HPIA	8.13.3.6		I
	homing_complete() has the structure shown in the table of section 3.6.	HPIA	8.13.3.6		I
	When the POD needs to perform a firmware upgrade, it will transmit the firmware_upgrade() to the Unidirectional Receiving Device.	HPIA	8.13.3.7		I
	firmware_upgrade() has the structure shown in the table of section 3.13.3.7.	HPIA	8.13.3.7		I
	The Unidirectional Receiving Device SHALL be capable of recognizing the set upgrade_source field in Table 8.13-I firmware_upgrade() as one of the following values - Unknown(00), QAM Inband Channel(01), QPSK OOB Channel(02),	HPIA	8.13.3.7		I
DpHm.3 4	The Unidirectional Receiving Device SHALL accept the following values of timeout_type in firmware_upgrade() APDU Table 8.13-J  Both timeouts(00), Transport timeout only(01), Download timeout only(02), No timeout(03),	HPIA	8.13.3.7	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DpHm.3 5	The Unidirectional Receiving Device SHALL use the download_timeout_period as the amount of time, in seconds, after the Unidirectional Receiving Device has received the firmware_upgrade APDU it will use to determine the POD module has become unstable.	HPIA	8.13.3.7	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DpHm.3 6	If the download_timeout_period expires before the firmware_upgrade_complete is received, the Unidirectional Receiving Device SHALL perform a PCMCIA reset on the POD.	HPIA	8.13.3.7	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DpHm.3 7	The Unidirectional Receiving Device SHALL reset it's download_timeout_period timer if another firmware_upgrade APDU is received from the POD before the firmware_upgrade_complete is received.	HPIA	8.13.3.8	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

DApHm.3 8	The Unidirectional Receiving Device SHALL accept download_timeout_period of 0000 as an infinite timeout period.	HPIA	8.13.3.7	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DApHm.1 8	After receiving firmware_upgrade(), if the upgrade_source is equal to the QAM inband channel(01), then the Unidirectional Receiving Device SHALL not deny the POD's request to access to the inband tuner through the Unidirectional Receiving Device Host Control resource inband_tune_req() APDU, the Unidirectional Receiving Device SHALL not interrupt a firmware upgrade until it receives the firmware_upgrade_complete().	HPIA	8.13.3.7	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DApHm.1 9	After receiving firmware_upgrade(), if the Unidirectional Receiving Device is not in the standby mode, then it SHALL display the user_notification_text.	HPIA	8.13.3.7	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	Any user_notification_text being displayed upon reception of the firmware_upgrade_complete should be removed.	HPIA	8.13.3.7		I
DApHm.3 9	The Unidirectional Receiving Device SHALL interpret the user_notification_text in firmware_upgrade() APDU in accordance with ISO-8859-1.	HPIA	8.13.3.7	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DApHm.2 1	The Unidirectional Receiving Device SHALL be able to decode and display texts in ISO-8859-1.	HPIA	8.13.3.7	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
DApHm.2 3	The Unidirectional Receiving Device SHALL send firmware_upgrade_reply() in response to the firmware_upgrade(). firmware_upgrade_reply() has the structure shown in the table of section 8.13-K	HPIA	8.13.3.8	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	The POD will not start the download operation until it receives firmware_upgrade_reply().	HPIA	8.13.3.8		I
	After the POD has completed its upgrade, it will transmit the firmware_upgrade_complete() to the Unidirectional Receiving Device.	HPIA	8.13.3.8		I
	firmware_upgrade_complete() has the structure shown in the table of section 8.13.3.9.	HPIA	8.13.3.8		I
DApHm.2 8	The Unidirectional Receiving Device SHALL act according to the following values of reset_request_status listed in Table 8.13-M of the firmware_upgrade_complete() APDU:  PCMCIA reset requested(00), POD reset requested(01), No reset requested(02),	HPIA	8.13.3.8	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

	If the POD wishes to cancel the firmware upgrade, it can send the firmware_upgrade_complete() with no reset requested.	HPIA	8.13.3.8		I
	When the reset_request_status is no_reset_requested, the Unidirectional Receiving Device MAY take control of the tuner if the source was inband.	HPIA	8.13.3.8		I

### 3.8 Extended Channel Protocol

Item	Feature	Spec	Ref	Support	Status
<b>Extended Channel - Physical Layer</b>					
ExchP.1	The Uni-Directional Receiving Device SHALL access the Extended Channel registers by setting CE1# high and CE2# low.	HPIA	6.5.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
ExchP.10	The Uni-Directional Receiving Device SHALL access the Extended Channel interface registers by activating the signals as described by the table in section 6.5 of reference HPIA Table 6.5-A.	HPIA	6.5.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	Uni-Directional Receiving Device MAY handle DA and FR bits by interrupt instead of polling.	HPIB	A.2.2.1.3.		I
ExchP.11	When the Uni-Directional Receiving Device sets an RS_flag after detection of an error condition, it SHALL set the RS_flag for both Data and Extended channels.	HPIA	6.5.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
ExchP.13	When the Uni-Directional Receiving Device has set the HC bit of the Control Register and read the FR bit as a '1', it SHALL write the number of bytes it wishes to send to the POD into the Size register and then SHALL write that number of data bytes to the data register.	HPIB	A.2.2.1.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
ExchP.14	The Uni-Directional Receiving Device SHALL not interrupt the write operation for any other operations on the interface except for reads of the Status Register.	HPIB	A.2.2.1.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
ExchP.15	The Uni-Directional Receiving Device SHALL reset the HC bit of the Control Register by writing '0' to it at the end of the transfer.	HPIB	A.2.2.1.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
ExchP.16	When the DA bit of the Status Register is '1' the Uni-Directional Receiving Device SHALL read the Size Register to find the number of bytes to be transferred. It SHALL then read that number of bytes from the Data Register.	HPIB	A.2.2.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
ExchP.17	The Uni-Directional Receiving Device SHALL not interrupt the read operation for any other operations on the interface except for reads of the Status Register.	HPIB	A.2.2.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M



ExchP.3	The Uni-Directional Receiving Device SHALL monitor the IIR bit in the Status Register periodically. When the Uni-Directional Receiving Device detects that this flag is set, it SHALL set the RS bit.	HPIA	6.5.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
ExchP.4	The Uni-Directional Receiving Device SHALL initiate a POD reset procedure when detecting IIR bit in Status Register is set	HPIA	6.5.2; 6.7.1.3. 3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
ExchP.5	The Uni-Directional Receiving Device SHALL read/write the hardware interface registers as outlined in section A.2.2.1 of reference HPIB.	HPIB	A.2.2.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>Extended Channel – Link Layer</b>					
ExchL.1	The Uni-Directional Receiving Device SHALL process the structure shown in section 7.2 of reference HPIA Table 7.2-A.	HPIWA	7.2.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	I
ExchL.5	The last indicator SHALL be set to '0' when at least one more datagram fragment follows. A '1' SHALL be used to indicate that this datagram fragment is the last	HPIA	7.2.		I
ExchL.7	The Uni-Directional Receiving Device SHALL not -use a flow_id of zero. It is reserved and is not to be assigned.	HPIA	7.2		I
ExchL.6	The first_fragment_indicator SHALL be set to a '1' when the fragment is the first of the datagram. A '0' SHALL indicate that this fragment is not the first.	HPIA	7.2.		I
ExchL.2	The Uni-Directional Receiving Device SHALL not transmit any data across the extended channel.	HPIA	7.2.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>Extended Channel Flow (Support)</b>					
	The POD is the link device for the QPSK modem; the Uni-Directional Receiving Device is the link device for the High Speed Uni-Directional Receiving Device Modem.	HPIA	8.9		I
ExchF.24	The Uni-Directional Receiving Device SHALL provide the hardware necessary to support a QPSK downstream out-of-band channel for the POD.	HPIA	8.9	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
ExchF.1	The Uni-Directional Receiving Device SHALL provide the Extended_Channel resource. The resource ID equals to 0x00a00041	HPIA	8.9	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
ExchF.2	The Uni-Directional Receiving Device SHALL send a New_flow_req() APDU to register a new flow with the link device. The new_flow_req() object has the syntax illustrated in the table of section 8.9.1 of reference HPIA.	HPIA	8.9.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
ExchF.4	The service_type field in New_flow_req() issued by Uni-Directional Receiving Device SHALL be MPEG_section, .	HPIA	8.9.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	C-M
ExchF.28	New_flow_cnf() SHALL have the syntax of the table in section 8.9.1 of reference HPIA.	HPIA	8.9.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

ExchF.30	The Uni-Directional Receiving Device SHALL interpret a value of zero in the flows_remaining field as no additional flows beyond the one currently requested can be supported.	HPIA	8.9.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
ExchF.11	The FLOW_ID value in Delete_flow_req() SHALL match one of the registered data flows.	HPIA	8.9.2.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
ExchF.36	The Uni-Directional Receiving Device SHALL not be adversely affected by the correctness or incorrectness of the 32-bit CRC present in MPEG_section Extended Channel data.	HPIA	8.9.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

### 3.9 Copy Protection Support

Item	Feature	Spec	Ref	Support	Status
<b>Copy Control Information (CCI)</b>					
CpsC.1	Uni-Directional Receiving Device SHALL apply the 2-bit EMI values to any approved external digital interface: 01 (no further copying permitted), 10 (one generation copying permitted) and 11 (copying prohibited)  Note : No requirement is made with respect to state "00"	HPIN	6.1.1.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
CpsC.4	Uni-Directional Receiving Device SHALL preserve the assigned or equivalent EMI values on any internal storage or recording of digital content.	HPIN	6	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	C-M
<b>License, Algorithm and Parameters</b>					
CpsL.1	Uni-Directional Receiving Device SHALL utilize production Diffie-Hellman system parameters g=DH_base=1024 bits and n=DH_prime =1024 bits from CableLabs	HPIN	3.1.3. 4.4.2.1.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
CpsL.6	Uni-Directional Receiving Device SHALL implement SHA-1 = Secure Hash Algorithm (used in Digital Signature Algorithm) according to FIPS PUB 180-1.	HPIN	4.5.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
CpsL.7	In using pseudorandom integer generator to generate other keys, Uni-Directional Receiving Device SHALL comply with SHA-1 based algorithm in FIPS PUB 186-2, appendix 3, section 3.3	HPIN	4.6.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
CpsL.8	Each Uni-Directional Receiving Device SHALL have a uniquely generated seed value that is set in the factory. The seed generator SHALL comply with FIPS PUB 140-2 Section 4.7.1 test for randomness	HPIN	4.6.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
CpsR.1	Uni-Directional Receiving Device SHALL provide "Copy Protection" Resource Resource_identifier equal to 0x00B000C1, type equal to 3	HPIN	8.2.1.1.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

CpsR.2	Uni-Directional Receiving Device SHALL provide the Copy Protection System with CP_system_id = 2	HPIN	8.2.2.2; 8.2.3.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
CpsR.4	Uni-Directional Receiving Device SHALL respond to the POD request with an SPDU open_session_response()	HPIN	8.2.1.2.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
CpsR.6	Uni-Directional Receiving Device SHALL respond to the POD request with a CP_open_cnf() with tag value 0X9F9001	HPIN	8.2.2.2.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
CpsR.8	Uni-Directional Receiving Device SHALL reply to POD's CP_data_req() message with a CP_data_cnf() with tag value 0X9F9003	HPIN	8.2.3.1Table 8.2-I	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

### Binding Procedure: New Uni-Directional Receiving Device Detection

CpsB.3	If under re-authentication the POD's and Unidirectional Receiver Device's authentication keys match, Uni-Directional Receiving Device SHALL use the stored value of certificate verification, DH keys, and Authentication keys.	HPIN	3.3.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
CpsB.4	Uni-Directional Receiving Device SHALL store the POD_ID, DHKey and AuthKey in non-volatile memory when the Binding Procedure is completed	HPIN	2.3.1.1 2.3.1.2 4.1.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

### Binding Procedure: Uni-Directional Receiving Device Authorization

CpsB.10	Uni-Directional Receiving Device SHALL send Host_DevCert, DH_pubKey <sub>H</sub> , SIGN <sub>H</sub> , and Host_ManCert in reply to POD's request, using the CP_data_cnf(). As referenced in Table 8.3-D	HPIN	8.3.2.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
CpsB.27	If the POD provides an invalid Certificate to the Uni-Directional Receiving Device, the UDRD SHALL display a message informing the user.	HPIN	3.2.5.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
CpsB.27a	When the Host / POD pairing information screen application info APDU is selected after the POD has provided an invalid certificate to the Uni-Directional Receiving Device, then the UDRD SHALL generate and display the following message: "Please call your cable operator and report an invalid CableCARD"	Appendix A	R-102	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

### Binding Procedure: DHKey Generation

CpsB.16	Uni-Directional Receiving Device SHALL generate a shared secret DH Key = 1024 bits using the DH public key and conventional DH protocol	HPIN	4.1 4.2.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
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### Binding Procedure: AuthKey Generation

CpsB.23	Uni-Directional Receiving Device SHALL calculate AuthKey <sub>H</sub> using SHA-1 function with variables DHKey <sub>H</sub> , Host_ID and POD_ID	HPIN	4.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
CpsB.24	Uni-Directional Receiving Device SHALL generate the Authentication Key only once (per POD/Uni-Directional Receiving Device pair) when the Uni-Directional Receiving Device and POD is first connected	HPIN	4.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

### Copy Protection (CP) Key Generation and Refresh

CpsK.7	Uni-Directional Receiving Device SHALL generate a nonce N_host = 64 bits and send it along with Host_ID in the clear to POD, using CP_data_cnf()	HPIN	8.2.3.2 4.2.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
CpsK.9	Uni-Directional Receiving Device SHALL compute SHA-1 key (Ks) using SHA-1 function with variables AuthKeyH, shared secret DHKey, N_Host and N_Module	HPIN	4.2.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
CpsK.10	Uni-Directional Receiving Device SHALL compute the Copy Protection Key Ks_DFAST using function DFAST with variable Ks	HPIN	4.2.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
CpsK.12	Uni-Directional Receiving Device SHALL compute the CP Key within 8 seconds of sending the CP_data_cnf() message.	HPIN	4.3.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>CCI: CCI Delivery</b>					
CpsC.9	Uni-Directional Receiving Device SHALL generate a new 8 byte random CCI_N_host for each CCI transfer.	HPIN	6.4.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
CpsC.12	Uni-Directional Receiving Device SHALL verify the fingerprint of CCI_auth received from POD. If Uni-Directional Receiving Device detects alteration of CCI, it SHALL replace the suspect CCI with 11 ("copy prohibited")	HPIN	6.4.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
CpsC.13	Uni-Directional Receiving Device SHALL calculate the CCI_ack using SHA-1 function with variables CCI, CP-Key, CCI_N_host, and CCI_N_module	HPIN	6.4.2.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>MPEG Transport Interface</b>					
CpsT.2	Uni-Directional Receiving Device SHALL process the transport scrambling control field of the MPEG transport packet to determine if the packet is clear-text (value =00) or encrypted: in single key mode (11); or in dual-key mode encrypted with EVEN key (10), or encrypted with ODD key (11) as defined in SCTE 41 2003, Table 4.3-A, and act accordingly.	HPIN	4.3.7, Table 4.3-A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	C-M
CpsT.3	If the Uni-Directional Receiving Device receives a CA_PMT_reply with "descrambling possible", the Uni-Directional Receiving Device SHALL send POD module a CA_PMT with ca_pmt_cmd_id=ok_descrambling	HPIB	8.4.3.4	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

### 3.10 Analog Copy Protection (Macrovision)

Item	Feature	Spec	Ref	Support	Status
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HACP.2	Uni-Directional Receiving Device SHALL use APS bits to control copy protection encoding on analog video outputs (Macrovision) as follows: APS=00 no encoding, utilize specific modes of analog protection encoding for APS=01,10,and 11 NOTE: Analog copy protection only applies to analog outputs as constrained by the license agreement	HPIN	6.1.2 Table 6.1-C	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	C-M
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### 3.11 Certificate Management

Item	Feature	Spec	Ref	Support	Status
CertMgt.1	The Uni-Directional Receiving Device SHALL validate the X.509 version 3 certificates as defined in Table 1.	Appendix A	R-300	Y <input type="checkbox"/> N <input type="checkbox"/>	M
CertMgt.2 5	The Uni-Directional Receiving Device signature mechanism SHALL use SHA-1 with RSA Encryption with specific OID 1.2.840.113549.1.1.5	Appendix A	R-301	Y <input type="checkbox"/> N <input type="checkbox"/>	M
CertMgt.2	The Uni-Directional Receiving Device SHALL have a Root CA Certificate as defined in Table 1	Appendix A	R-302	Y <input type="checkbox"/> N <input type="checkbox"/>	M
CertMgt.3	The Uni-Directional Receiving Device SHALL have a CA Certificate as defined in Table 2	Appendix A	R-303	Y <input type="checkbox"/> N <input type="checkbox"/>	M
CertMgt.3 a	The Uni-Directional Receiving Device SHALL validate the keyUsage extension with the keyCertSign and cRLSign bits asserted, and have the critical and mandatory flags set in the CA Certificate as received from the POD.	Appendix A	R-304	Y <input type="checkbox"/> N <input type="checkbox"/>	M
CertMgt.3 b	The Uni-Directional Receiving Device SHALL validate the subjectKeyIdentifier extension composed of a keyIdentifier value which SHALL be the 160-bit SHA-1 hash of the value of the BIT STRING subjectPublicKey (excluding the tag, length, and number of unused bits from the ASN1 encoding) and have the non-critical and mandatory flags set in the CA Certificate as received from the POD.	Appendix A	R-305	Y <input type="checkbox"/> N <input type="checkbox"/>	M
CertMgt.3 c	The Uni-Directional Receiving Device SHALL validate the authorityKeyIdentifier extension which SHALL include a keyIdentifier value that is identical to the subjectKeyIdentifier in the CA certificate and have the non-critical and mandatory flags set in the CA Certificate as received from the POD.	Appendix A	R-306	Y <input type="checkbox"/> N <input type="checkbox"/>	M

CertMgt.3 d	The Uni-Directional Receiving Device SHALL validate the basicConstraints extension using the parameters cA true and pathLenConstraint = 0 and have the critical and mandatory flags set in the CA Certificate as received from the POD.	Appendix A	R-307	Y <input type="checkbox"/> N <input type="checkbox"/>	M
CertMgt.4	The Uni-Directional Receiving Device, SHALL have a Device Certificate as defined in Table 3	Appendix A	R-308	Y <input type="checkbox"/> N <input type="checkbox"/>	M
CertMgt.4 a	The Uni-Directional Receiving Device SHALL validate the keyUsage extension with the digitalSignature and keyEncipherment bits asserted, and have the critical and mandatory flags set in the Device Certificate as received from the POD.	Appendix A	R-309	Y <input type="checkbox"/> N <input type="checkbox"/>	M
CertMgt.4 b	The Uni-Directional Receiving Device SHALL validate the authorityKeyIdentifier extension which SHALL include a keyIdentifier value that is identical to the subjectKeyIdentifier in the certificate and have the non-critical and mandatory flags set in the Device Certificate as received from the POD.	Appendix A	R-310	Y <input type="checkbox"/> N <input type="checkbox"/>	M
CertMgt.1 0	The Uni-Directional Receiving Device Host_ID MUST be expressed as hexadecimal digits. The Alpha HEX characters (A-F) MUST be expressed as uppercase letters.	Appendix A	R-311	Y <input type="checkbox"/> N <input type="checkbox"/>	M
CertMgt.1 1	<p>The Uni-Directional Receiving Device Host_ID defined in the CN field of the X.509 certificate SHALL comply with the following requirements:</p> <ul style="list-style-type: none"> <li>• CableLabs assigns a random 3 decimal digit Host manufacturer number upon request by any DFAST signatory who has successfully completed Host certification.</li> <li>• Host manufacturers shall set the 10 most significant bits of the 40-bit Host_ID to the binary equivalent of their assigned Host manufacturer number.</li> <li>• Host manufacturers shall set the remaining 30-bits of the Host_ID to a value between zero and 999,999,999 decimal, 11,1011,1001,1010,1100,1001,1111, 1111 binary, 3B9AC9FF hexadecimal, to facilitate on-screen presentation to subscribers and manual report back.</li> <li>• The Host_ID (30-bits) assigned to each Host device certificate SHALL be unique to each Host device.</li> </ul>	Appendix A	R-312	Y <input type="checkbox"/> N <input type="checkbox"/>	M

CertMgt.1 2	The Uni-Directional Receiving Device rules for certificate chain validation of POD Device and CableLabs CA certificates SHALL fully comply with IETF RFC 3280 where they are referred to as "Certificate Path Validation."  Note: This PICS is for verification of the Host ability to perform certificate chain validation of the POD.	Appendix A	R-313	Y <input type="checkbox"/> N <input type="checkbox"/>	M
CertMgt.1 4	The Uni-Directional Receiving Device SHALL validate that the start date for any end-entity certificate SHALL be the same as or later than the start date of the issuing CA certificate validity period.	Appendix A	R-314	Y <input type="checkbox"/> N <input type="checkbox"/>	M
CertMgt.1 6	The Uni-Directional Receiving Device SHALL validate that the period of the POD's device certificate SHALL begin with the POD's date of manufacture and extend to not greater than 30 years after the POD's date of manufacture.	Appendix A	R-315	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
CertMgt.1 8A	The Uni-Directional Receiving Device SHALL be able to handle certificate serialNumber values up to 20 octets.	Appendix A	R-316	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
CertMgt.2 6	Unidirectional Digital Cable Products shall be designed and manufactured in a manner to effectively frustrate attempts to discover or reveal (i) the unique number, of a specified bit length, assigned to each Unidirectional Digital Cable Product, the numbers used in the process for encryption or decryption of Controlled Content, or the private key used in the process for encryption or decryption of Controlled Content (collectively, " <b>Keys</b> ") and (ii) the methods and cryptographic algorithms used to generate such Keys. For the avoidance of doubt, Keys includes the private key used for authentication. All authentication private keys shall be protected using encryption or obfuscation methods when being transferred across internal buses and stored in memory.	Appendix A	R-317	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

### 3.12 In-Band Channel Support

Item	Feature	Spec	Ref	Support	Status
HstlBCS 1	Uni-Directional Receiving Device SHALL be able to process MPEG-2 compliant Transport Streams in accordance with ANSI/SCTE-54 2002 as amended by DVS/435r4.	Appendix A	R-9	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

HstlBCS 2	Uni-Directional Receiving Device SHALL decode audio visual streams compliant with the T-STD buffer model as specified in Section 2.4.2.3 of ISO/IEC 13818-1	HPIL	5.1.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M CMV
HstlBCS 3	Uni-Directional Receiving Device SHALL decode and display (if appropriate) Stream Types 0x02 and 0x80.	HPIL	5.8.2.1 and 5.8.2 Table 5.4	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M CMA
HstlBCS 4	Uni-Directional Receiving Device SHALL decode and display (if appropriate) Stream Types 0x81, as specified in Section 3.6 of Annex A of ATSC Standard A/52 and as further constrained in Annex B of ATSC Standard A/53.	HPIL	5.8.2.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M CMV
HstlBCS 6	The Uni-Directional Receiving Device SHALL not be adversely affected by the presence of MPEG Registration Descriptors described in Section 2.6.8 of ISO/IEC 13818-1 present in either the inner or outer loop of the PMT.	HPIL	5.2.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HstlBCS 16	The Uni-Directional Receiving Device SHALL not be adversely affected by the presence of discontinuity_indicator in adaptation headers in TS packets of the PMT_PID. (Section 2.4.4.5 of ISO/IEC 13818-1)	HPIL	5.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HstlBCS 18	The Uni-Directional Receiving Device SHALL not be adversely affected by the presence of Private table sections in addition to Program Map Tables sections present in TS packets on the PMT_PID.	HPIL	5.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HstlBCS 19	Uni-Directional Receiving Device SHALL interpret PSI with an average aggregate bit rate of 80,000bps for TS packets of PID 0x0000, PID 0x0001, and PMT_PID.	HPIL	5.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HstlBCS 183	The Uni-Directional Receiving Device SHALL use the Presentation Time-Stamp (PTS) to perform A/V sync.	HPIL	5.6	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M CMV
HstlBCS 47	Uni-Directional Receiving Device SHALL not be adversely affected by the presence of a rate of at least 250,000 bps for base_PID (0x1FFB) SI stream.	HPIL	5.7.1.2; Table 5.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HstlBCS 48	Uni-Directional Receiving Device SHALL not be adversely affected by the presence of a rate of at least 250,000 bps for EIT_PID SI stream	HPIL	5.7.1.2; Table 5.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HstlBCS 49	Uni-Directional Receiving Device SHALL not be adversely affected by the presence of a rate of at least 250,000 bps for ETT_PID SI stream	HPIL	5.7.1.2 Table 5.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HstlBCS 69	Uni-Directional Receiving Device SHALL support Program Association Table (PAT) with table ID = 0x00, PID = 0	HPIL	5.8.1; Table 5.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M



HstlBCS 71	Uni-Directional Receiving Device SHALL use the PMT_PID field in the PAT to locate the TS_program_map_section()s of the Program Map Table (PMT). The Uni-Directional Receiving Device SHALL support such TS_program_map_section()s	HPIL	5.8.1; Table 5.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HstlBCS 72	Uni-Directional Receiving Device SHALL not be adversely affected by the presence or absence of table sections not identified as required elsewhere in this document.	HPIL	5.8.1; Table 5.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HstlBCS 93	Uni-Directional Receiving Device SHALL not be adversely affected by the presence or absence of stream types not identified as required elsewhere in this document	HPIL	5.8.2; Table 5.4	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HstlBCS 125	Uni-Directional Receiving Device SHALL not be adversely affected by the presence or absence of the descriptor tag 0x0A = ISO_639_language_descriptor()	HPIL	5.8.3, Table 5.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HstlBCS 132	Uni-Directional Receiving Device SHALL not be adversely affected by the presence or absence of descriptors not identified as required elsewhere in this document.	Appendix A	R-10	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HstlBCS.1 43	Uni-Directional Receiving Device SHALL recognize descriptor tag 0x87 as the content_advisory_descriptor()	HPIL	5.8.3, Table 5.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	C-M
HstlBCS 145	Uni-Directional Receiving Device SHALL support descriptor tag 0xA0 = Extended_channel_name_descriptor()	HPIL	5.8.3, Table 5.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	C-M
HstlBCS.9 a	Uni-Directional Receiving Device SHALL not be adversely affected by the presence of an incorrect service location descriptor in the PSIP TVCT.	Appendix A	R-9a	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

### 3.13 OOB FDC Channel Support

Item	Feature	Spec	Ref	Support	Status
FDCP.2	Uni-Directional Receiving Device SHALL support DRX (Receive Data) at rates 1.544 Mbps, 3.088 Mbps and 2.048 Mbps	HPIA	6.4	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
FDCP.3	Uni-Directional Receiving Device SHALL support CRX (Receive Gapped Clock) at rates 1.544 MHz, 3.088 MHz and 2.048 MHz.	HPIA	6.4, 6.4.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
FDCP.6	Uni-Directional Receiving Device SHALL be compatible with normal 3.3V CMOS levels.	HPIA	6.4.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
FDCP.11	Uni-Directional Receiving Device SHALL provide a set-up time ( $t_{su}$ ) of 10ns minimum. Measured from DRX valid at 1.5V to CRX rising at 1.5V	HPIA	6.4.1 Figure 6.4-3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

FDCP.12	Uni-Directional Receiving Device SHALL provide a hold time ( $t_H$ ) of 5ns minimum. Measured from CRX rising 1.5V to DRX invalid at 1.5V	HPIA	6.4.1 Figure 6.4-3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
FDCP.14	The Uni-Directional Receiving Device SHALL be able to navigate (tune) using the System information when it is carried in OOB-FDC, as described in reference NIR.	Appendix A	R-11	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	C-M

### 3.14EAS

Item	Feature	Spec	Ref	Support	Status
HNIEAS.2	When the Uni-Directional Receiving Device is connected to a POD the Uni-Directional Receiving Device SHALL process and respond to EAS in the out-of-Band according to sections 4, 5 and 6 of NIQ.	NIQ	4, 5,6	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	C-M
HNIEAS.3	Any cable_emergency_alert() message received in_Band SHALL be discarded if the Uni-Directional Receiving Device has current access to an out-of-Band channel	NIQ	6.4	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	C-M
HNIEAS.4	In case there is an overlapping message, whenever a new EA event is seen at the Uni-Directional Receiving Device, the Uni-Directional Receiving Device SHALL immediately end processing any prior event that might still be in progress and begin processing and potentially responding to the new event	NIQ	6.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HNIEAS.5	In case the network sends multiple copies of a cable_emergency_alert() message, the Uni-Directional Receiving Device SHALL discard duplicates based on sequence_number checking	NIQ	6.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HNIEAS.6	The Uni-Directional Receiving Device SHALL tune to the details channel identified by details_OOB_source_ID if audio override is required.	NIQ	6.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

HNIEAS.7	For EAS event that passes filtering and priority processing where the alert_message_time_remaining is non-zero, the Uni-Directional Receiving Device SHALL stay on the details channel for a period of time given by alert_message_time_remaining. At the end point of such a message the Uni-Directional Receiving Device SHALL re-acquire the service that was active when the EAS event occurred.	NIQ	6.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HNIEAS.8	When the alert_message_time_remaining value is set to zero (indefinite) the Uni-Directional Receiving Device SHALL not return to original service unless it is initiated by the user or another cable_emergency alert message is received that meets the conditions of Sec. 5.2 (Overlapping Events) and that message results in completion of the alert processing.	NIQ	6.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HNIEAS.9	When Uni-Directional Receiving Device is operating without a Point Of Deployment (POD) module in place SHALL process inband EAS messages as described in Sections 4 and 5 of NIQ.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>Miscellaneous processing</b>					
HNIEAS.10	When monitoring PID 0x1FFB in-band or PID 0x1FFC out-of-band the Uni-Directional Receiving Device SHALL recognize an MPEG table section with table ID 0xD8, as a cable_emergency_alert() message.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HNIEAS.11	The Uni-Directional Receiving Device SHALL silently discard* any cable_emergency_alert() message in which the value of the protocol_version field is non-zero.  * 'Silently Discard' means 'display nothing, take no action and not be adversely affected by'.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HNIEAS.12	When an out-of-band channel is available, the Uni-Directional Receiving Device SHALL silently discard* any cable_emergency_alert() message received via the in-band (FAT) channel.  * 'Silently Discard' means 'display nothing, take no action and not be adversely affected by'.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

HNIEAS.13	While not in "standby" power state, and when an out-of-band channel is available, the Uni-Directional Receiving Device SHALL keep open and monitor an Extended Channel flow of type MPEG_section on PID 0x1FFC to watch for cable_emergency_alert() message events.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HNIEAS.14	While not in "standby" power state, and when no out-of-band channel is available, the Uni-Directional Receiving Device SHALL monitor PID 0x1FFB in-band to watch for cable_emergency_alert() message events.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>Duplicate detection processing</b>					
HNIEAS.15	For purposes of duplicate detection, the Uni-Directional Receiving Device SHALL record the most recently received sequence_number value in each cable_emergency_alert() messages received, even those that are ultimately discarded.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HNIEAS.16	The Uni-Directional Receiving Device SHALL process the sequence_number in cable_emergency_alert() message in order to detect and discard duplicate transmissions. A cable_emergency_alert() message SHALL be discarded if the sequence_number matches the most recently received cable_emergency_alert() message.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HNIEAS.17	Just following initial application of main power to the unit and prior to completion of POD initialization (if a POD is present), the sequence_number shall be considered to be unknown. Therefore, in that state, the Uni-Directional Receiving Device SHALL not discard a cable_emergency_alert() message based on its sequence_number.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HNIEAS.18	When no out-of-band channel is available, upon tuning to a new RF carrier, the sequence_number shall be considered to be unknown. Therefore, in that state, the Uni-Directional Receiving Device SHALL not discard a cable_emergency_alert() message based on its sequence_number.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

HNIEAS.19	Just following establishment of communication on the out-of-band channel (e.g., just after POD initialization and/or application of main power to the unit), the sequence_number shall be considered to be unknown. Therefore, in that state, the Uni-Directional Receiving Device SHALL not discard a cable_emergency_alert() message based on its sequence_number.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HNIEAS.19a	Just following loss of communication on the out-of-band channel (e.g., just after POD removal), the sequence_number shall be considered to be unknown. Therefore, in that state, the Uni-Directional Receiving Device SHALL not discard a cable_emergency_alert() message based on its sequence_number.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>Exception list processing</b>					
HNIEAS.20	When no out-of-band channel is available, the Uni-Directional Receiving Device SHALL discard any cable_emergency_alert() message in which the currently tuned channel matches any exception_major_channel_number and exception_minor_channel_number pair found in the exception list in the message.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HNIEAS.21	When an out-of-band channel is available, the Uni-Directional Receiving Device SHALL discard any cable_emergency_alert() message in which the currently tuned source_ID in the currently-tuned channel matches any exception_OOB_source_ID listed in the message.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>Alert priority processing</b>					
HNIEAS.22	The Uni-Directional Receiving Device SHALL discard any cable_emergency_alert() message with an alert_priority field value of 0.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

HNIEAS.23	When fully powered, the Uni-Directional Receiving Device SHALL process and respond to a cable_emergency_alert() message that passes duplicate detection and exception processing tests if the alert_priority is any value in the range 1 to 3 and the currently acquired service is unscrambled. The Uni-Directional Receiving Device SHALL respond by scrolling alert_text() over video. Audio SHALL NOT be affected.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HNIEAS.24	When fully powered, the Uni-Directional Receiving Device SHALL process and respond to a cable_emergency_alert() message that passes duplicate detection and exception processing tests if the alert_priority is any value in the range 4 to 11. The Uni-Directional Receiving Device SHALL respond by scrolling alert_text() over video. Audio SHALL NOT be affected.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HNIEAS.25	When fully powered, the Uni-Directional Receiving Device SHALL process and respond to a cable_emergency_alert() message that passes duplicate detection and exception processing tests if the alert_priority is any value in the range 12 to 15. Response to the alert SHALL involve tuning to (or staying tuned to) the Details channel.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>alert_message_time_remaining processing</b>					
HNIEAS.26	When processing of a cable_emergency_alert() message involves tuning to the Details channel and the alert_message_time_remaining field is non-zero, the Directional Receiving Device SHALL remain on the Details channel, for the number of seconds indicated in alert_message_time_remaining (unless processing a new alert extends the time before returning to the channel that was interrupted by the alert).	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

HNIEAS.27	When processing of a cable_emergency_alert() message involves tuning to the Details channel and the alert_message_time_remaining field is zero, the Directional Receiving Device SHALL remain on the Details channel until the viewer manually changes channels or until processing of a new cable_emergency_alert() message results in a return to the channel that was originally interrupted or in tuning to a new Details channel.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>Alert text display</b>					
HNIEAS.28	When display of alert_text() is required ("Scroll alert_text() over video" in Figure 1), the Uni-Directional Receiving Device SHALL scroll the text slowly across the top of the video screen, from right to left, over video.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HNIEAS.29	When display of alert_text() is required ("Scroll alert_text() over video" in Figure 1 of NIQ), if the entire text message display cannot be completed within the time given by alert_message_time_remaining, the Uni-directional Receiving Device SHALL continue the text display until it is complete.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HNIEAS.30	The Uni-Directional Receiving Device SHALL process multi-lingual alert_text(), and shall choose at most one language for display when text is provided multi-lingually.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>Overlapping alert message processing</b>					
HNIEAS.31	If, during the display of alert_text(), a new cable_emergency_alert() message is received, the Uni-Directional Receiving Device SHALL process it for duplicate detection, exception processing, and alert priority. If the overlapping alert passes these tests, alert_text() display SHALL be stopped, the text SHALL be erased, and the new alert SHALL be processed.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

HNIEAS.32	If, when tuned to the Details channel as a result of processing a cable_emergency_alert() message, a new cable_emergency_alert() message is received, the Uni-Directional Receiving Device SHALL process it for duplicate detection, exception processing, and alert priority. If the overlapping alert is discarded as a result of tests, the processing of the prior alert SHALL be unaffected.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HNIEAS.33	If, when tuned to the Details channel as a result of processing a cable_emergency_alert() message, a new cable_emergency_alert() message is received, the Uni-Directional Receiving Device SHALL process it for duplicate detection, exception processing, and alert priority. If the overlapping alert passes these tests, the new alert SHALL be processed.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HNIEAS.34	When tuned to a Details channel as a result of processing a cable_emergency_alert() message, and when a new cable_emergency_alert() message arrives that passes duplicate detection, exception processing, and alert priority tests, and when that new alert will require tuning to the same Details channel, the Uni-Directional Receiving Device SHALL not cause an audio/video glitch to occur.	NIQ	5.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	A cable_emergency_alert() message may be sent for the purposes of extending the time period spent on the Details channel.	NIQ	5.2		I



HNIEAS.35	When tuned to a Details channel as a result of processing a cable_emergency_alert() message, and when a new cable_emergency_alert() message arrives that passes duplicate detection, exception processing, and alert priority tests, and when that new alert will require tuning to the same Details channel, the Uni-Directional Receiving Device SHALL remain on the Details channel for the amount of time indicated in the alert_message_time_remaining field given in the newly received alert (where the value 0 means "remain indefinitely" ), or until an overlapping alert is processed that changes the channel, or until the channel is manually changed by the user.	NIQ	5.2, 6.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HNIEAS.36	When tuned to a Details channel as a result of processing a cable_emergency_alert() message, and when a new cable_emergency_alert() message arrives that passes duplicate detection, exception processing, and alert priority tests, and when that new alert will require tuning to a different Details channel, the Uni-Directional Receiving Device SHALL tune to the new Details channel.	NIQ	5.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HNIEAS.37	When tuned to a Details channel as a result of processing a cable_emergency_alert() message, and when a new cable_emergency_alert() message arrives that passes duplicate detection, exception processing, and alert priority tests, and when that new alert involves text display, the Uni-Directional Receiving Device SHALL re-acquire the channel that had been interrupted by the original alert and then process the new alert.	NIQ	5.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HNIEAS.38	If, when tuned to the Details channel as a result of processing a cable_emergency_alert() message, a new cable_emergency_alert() message is received, the Uni-Directional Receiving Device SHALL process it for duplicate detection, exception processing, and alert priority. If the overlapping alert is discarded as a result of these tests, processing of the prior alert SHALL be unaffected.	NIQ	6.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>Descriptors processing</b>					

HNIEAS.39	The Uni-Directional Receiving Device SHALL remain unaffected by the presence or absence of one or more descriptors that may be present in the cable_emergency_alert() message.	NIQ	Appendix A	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
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### 3.15 Ratings

Item	Feature	Spec	Ref	Support	Status
HNIRate.4	Uni-Directional Receiving Devices with integrated display and without off-air tuning capability that also provide component analog or uncompressed digital output streams, SHALL decode and display content advisory data as defined by CEA/EIA-608-B and required by FCC 47 CFR Part 15.120	Appendix A	R-201	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	C-M

### 3.16 FAT Channel RF Performance Parameters

Item	Feature	Spec	Ref	Support	Status
HFATrf. 1	The Uni-Directional Receiving Device SHALL be capable of receiving and demodulating a Forward Application Transport channel with either 64 or 256 QAM modulation.	HB	4.4.2 a)	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HFATrf. 2	The Uni-Directional Receiving Device SHALL be able to demodulate signals compliant with the SCTE 07 2000 for the transmission, Physical layer modulation, coding, synchronization, and Error Correction.	Appendix A	R-12	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HFATrf. 5	The Uni-Directional Receiving Device shall have tuning agility over the range of 54 MHz to 864MHz (IRC/HRC/Standard Channel Plans).	Appendix A	R-13	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HFATrf. 7	RF Input Impedance SHALL have a nominal impedance of 75 ohms unbalanced.	Appendix A	R-14	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HFATrf. 6	The Uni-Directional Receiving Device RF Input Return Loss SHALL be 3 dB minimum over full tuning range.	Appendix A	R-15	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HFATrf. 8	The Uni-Directional Receiving Device SHALL tune and receive Analog visual carrier signals over the RF Input Level Range from 0 dBmV minimum to +15 dBmV maximum	Appendix A	R-16.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

HFATrf. 9	The Uni-Directional Receiving Device SHALL tune and receive Analog aural carrier signals over the RF Input Level Range from -10 to -17 dBc	Appendix A	R-17	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HFATrf. 10	The Uni-Directional Receiving Device SHALL tune and receive Digital 64 QAM signals over the RF Input Level Range signal from -15 dBmV to +15 dBmV.	Appendix A	R-18	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HFATrf. 11	The Uni-Directional Receiving Device SHALL tune and receive Digital 256 QAM signals over the RF Input Level Range signal from -12 dBmV to +15 dBmV.	Appendix A	R-19	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HFATrf. 13	The Uni-Directional Receiving Device SHALL tune and receive Standard/HRC/IRC signals that deviate over the allowable FCC tolerance range as described in 47 CFR 76.612.	Appendix A	R-20	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HFATrf. 23	The Uni-Directional Receiving Device SHALL not be adversely affected by AM Hum Modulation on digital carriers of less than or equal to 3% p-p.	Appendix A	R-23	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HFATrf. 26	The Uni-Directional Receiving Device SHALL tune and receive with Group Delay Variation of $\leq 0.25 \mu\text{sec/MHz}$ across the 6-MHz channel. with Group Delay Variation introduced such that the Chroma/Luma delay of CFR47.76, the Amplitude Ripple of HFATrf.32 and the Microreflections of HFATrf.29 are not exceeded.	Appendix A	R-24	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HFATrf. 27	The Uni-Directional Receiving Device SHALL tune and receive with Phase Noise of $\leq -86 \text{ dBc/Hz @ } 10 \text{ kHz}$ offset (relative to the center of QAM signal spectrum).	Appendix a	R-25	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HFATrf. 28	The Uni-Directional Receiving Device SHALL tune and receive with Amplitude Ripple on digital channels of $\leq 5 \text{ dB p-p}$ within the 6-MHz channel with Amplitude Ripple introduced such that the Chroma/Luma delay is less than CFR47.76, Group Delay Variation of HFATrf.26, and the Microreflections of HFATrf.29 are not exceeded	Appendix A	R-26	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HFATrf. 32	The Uni-Directional Receiving Device SHALL tune and receive with Amplitude Ripple on analog channels of $\leq 4 \text{ dB p-p}$ within the 6-MHz channel. with Amplitude Ripple introduced such that the Chroma/Luma delay is less than CRF47.76 , Group Delay Variation of HFATrf.26 and the Microreflections of HFATrf.29 are not exceeded.	Appendix A	R-27	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

HFATrf.29	The Uni-Directional Receiving Device SHALL tune and receive with Microreflections of (assumes one dominant echo with max. specified amplitude in dB relative to the primary QAM signal) -10 dB at $\leq 0.5 \mu\text{s}$ -15 dB at $\leq 1 \mu\text{s}$ -20 dB at $\leq 1.5 \mu\text{s}$ -30 dB at $\leq 4.5 \mu\text{s}$ With Microreflections introduced such that the Chroma/Luma delay is less than CFR47.76, Group Delay Variation of HFATrf.26 and the Amplitude Ripple of HFATrf.32 are not exceeded.	Appendix A	R-28	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HFATrf.31	The Uni-Directional Receiving Device SHALL tune and receive signal with an interleaver depth of greater than or equal to $I = 64$ Burst Noise of not longer than 25- $\mu\text{s}$ at 10-Hz repetition rate.	Appendix A	R-29	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

### 3.17 FD Channel RF Performance Parameters

Item	Feature	Spec	Ref	Support	Status
<b>Common Requirements to ANSI SCTE 55-1 and ANSI SCTE 55-2</b>					
HFDCrf.5	The Uni-Directional Receiving Device SHALL be able to tune FDC signals over the range from 70 MHz to 130 MHz.	Appendix A	R-100	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HFDCrf.5a	The Uni-Directional Receiving Device SHALL be able to tune any nominal carrier frequency in the FDC that is an integer multiple of 250 kHz between the minimum and maximum carrier frequencies, inclusive and the specific fixed frequency of 104.200 MHz.	Appendix A	R-101	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HFDCrf.7	The Uni-Directional Receiving Device SHALL be capable of receiving symbols transmitted with a Frequency Stability of of +/- 50 ppm measured at the upper limit of the frequency range.	HPID; Appendix A	2.1.1; Table 2-2 R-30	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HFDCrf.8	The Uni-Directional Receiving Device SHALL be capable of receiving FDC with a RF Input level range of -15 to +15 dBmV	Appendix A	R-31	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

Item	Feature	Spec	Ref	Support	Status
HFDCrf.12	The Uni-Directional Receiving Device SHALL tolerate a Group Delay variation in channel, measured over Nyquist bandwidth of 200 ns max in channel. With Group Delay Variation introduced such that the Chroma/Luma delay is less than or equal to the Amplitude Ripple of HFATrf.32 and the Microreflections of HFATrf.29 are not exceeded.	Appendix A	R-32	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>ANSI SCTE 55-2 Standard</b>					
HFDCrf.24	The Uni-Directional Receiving Device SHALL be capable of receiving symbols created with a Symbol Rate Accuracy of +/- 50 ppm.	HPID	2.1.1; Table 2-2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HFDCrf.27	The Uni-Directional Receiving Device SHALL operate when I/Q Amplitude Imbalance < 1.0 dB	HPID	2.1.1; Table 2-2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HFDCrf.27 A	The Uni-Directional Receiving Device SHALL operate within the I/Q phase imbalance of less than or equal to 2 degrees.	HPID	2.1.1; Table 2-2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>ANSI SCTE 55-1 Standard</b>					
HFDCrf.32	The Uni-Directional Receiving Device SHALL operate within the I/Q amplitude imbalance of less than or equal to 0.5dB.	HPIE	5.1.4, table 3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HFDCrf.33	The Uni-Directional Receiving Device SHALL operate within the I/Q phase imbalance of less than or equal to 1 degree.	HPIE	5.1.4, table 3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

### 3.18 Digital Video

Item	Feature	Spec	Ref	Support	Status
HNETdig_vid.2	The Uni-Directional Receiving Device SHALL support all video compression formats listed in Table 3 of SCTE 43.	NIU	Table 3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M CMV
HNETdig_vid.3	The Unidirectional Receiving Device SHALL support low_delay flag set to "1" contained in the sequence_extension() following the sequence_header() of the video_sequence().	NIF	2.4.2.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M CMV
HNETdig_vid.7	The Uni-Directional Receiving Device SHALL support Sequence Header Constraints bit_rate_value <= 0x17AE8	NIU	5.1.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M CMV

HNETdig_vid.8	The Uni-Directional Receiving Device SHALL support Sequence Header Constraints vbv_buffer_size_value <= 0x1E8	NIU	5.1.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M CMV
HNETdig_vid.10	The Uni-Directional Receiving Device SHALL support Sequence Extension Constraints profile_and_level_indication = 0x48	NIU	5.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M CMV
HNETdig_vid.11	The Uni-Directional Receiving Device SHALL support Sequence Extension Constraints profile_and_level_indication = 0x44	NIU	5.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M CMV
HNETdig_vid.12	The Uni-Directional Receiving Device SHALL support Sequence Extension Constraints chroma_format = '01'	NIU	5.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M CMV
HNETdig_vid.13	The Uni-Directional Receiving Device SHALL support Sequence Extension Constraints horizontal_size_extension = '00'	NIU	5.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M CMV
HNETdig_vid.14	The Uni-Directional Receiving Device SHALL support Sequence Extension Constraints vertical_size_extension = '00'	NIU	5.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M CMV
HNETdig_vid.15	The Uni-Directional Receiving Device SHALL support Sequence Extension Constraints bit_rate_extension = 0x000	NIU	5.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M CMV
HNETdig_vid.16	The Uni-Directional Receiving Device SHALL support Sequence Extension Constraints vbv_buffer_size_extension = 0x00	NIU	5.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M CMV
HNETdig_vid.17	The Uni-Directional Receiving Device SHALL support Sequence Extension Constraints frame_rate_extension_n = '00'	NIU	5.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M CMV
HNETdig_vid.18	The Uni-Directional Receiving Device SHALL support Sequence Extension Constraints frame_rate_extension_d = '0000 0'	NIU	5.1.3	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M CMV
HNETdig_vid.19	The Uni-Directional Receiving Device SHALL not be adversely affected by a vbv_delay = 0xFFFF or 0xAFC8	NIU	5.1.5	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

### 3.19 Digital Audio

Item	Feature	Spec	Ref	Support	Status
HNETdig_aud.1	The Uni-Directional Receiving Device SHALL process Audio stream_type = 0x81 as defined in ATSC A/52 and constrained in ATSC A/53.	HPIL	5.8.2.2, 5.8.3, 5.8.3.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M CMA
HNETdig_aud.2	The Uni-Directional Receiving Device SHALL allow access to each available Complete Main audio stream of stream type 0x81 in a given service.	HD	Annex B Section 6	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HNETdig_aud.5	The Uni-Directional Receiving Device with audio decoding capabilities SHALL support the frequency code fscod = '00' (which is the sampling rate of 48 kHz).	NIT; HD	5.4.1.3; ANNEX B 5.1, 5.2	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	C-M
HNETdig_aud.6	The Uni-Directional Receiving Device with audio decoding capabilities SHALL accept the audio constraints called out in table B1 of reference HD: Any main audio service or associated audio service containing all necessary program elements will have the frmsizecod element less than or equal to '011110', indicating 448 kbps	HD	Table B1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	C-M
HNETdig_aud.11	The Uni-Directional Receiving Device SHALL not be adversely affected by any audio service type (bsmod) defined in HD Annex B Table B2.	HD; Appendix A	ANNEX B 6.2 R-33	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

### 3.20 NTSC Analog Channels

Item	Feature	Spec	Ref	Support	Status
HVBIPT.1	The Uni-Directional Receiving Device SHALL receive analog channels that are NTSC RF AM-VSB modulated signals in accordance with current cable-system practice and applicable FCC rules.	Appendix A	R-34	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

### 3.21 Analog Closed Caption

Item	Feature	Spec	Ref	Support	Status
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HNIACC.1	For analog NTSC, closed captions are carried in line 21 of the vertical blank line (VBI). The encoding of NTSC closed caption is based on FCC part 15.119 and CEA/EIA-608-B. Uni-Directional Receiving Devices with integrated displays and without off-air tuning capability SHALL be able to display this information.	Appendix A	R-35	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
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### 3.22 Digital Closed Caption

Item	Feature	Spec	Ref	Support	Status
HSTDCC.1	The Uni-Directional Receiving Device SHALL process and extract closed captioning information from MPEG picture level user_data() fields formatted and transported using ANSI SCTE 21 2001, when present, identified with user_data_type_code value of '0x03' and cc_type values '00' and '01' and carried in the cc_data_1 and cc_data_2 fields	Appendix A	R-36	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HSTDCC.2	Uni-Directional Receiving Devices built before July 1 <sup>st</sup> , 2008, SHALL process and extract closed captioning information from MPEG picture level user_data() fields formatted and transported using ANSI SCTE 20 2001, when present, unless MPEG picture level user_data() fields formatted and transported using SCTE 21 is also available.	Appendix A	R-36a	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HSTDCC.3	In the case where a MPEG picture level user_data() field includes data formatted and transported via both aforementioned methods (SCTE 20 and SCTE 21), the Uni-Directional Receiving Device MAY use closed captioning data recovered from either method.	Appendix A	R-36b	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	O
HSTDCC.3a	In the case where a MPEG picture level user_data() field formatted and transported via SCTE 21 includes any cc_type values of '10' or '11', the Uni-Directional Receiving Device MAY use such data exclusively for captioning operation, notwithstanding the output requirements of HSTDCC.4.	Appendix A	R-36c		C-M
HSTDCC.4	The Uni-Directional Receiving Device SHALL, on all NTSC analog outputs, modulate such extracted data (HSTDCC.1, HSTDCC.2 or HSTDCC.3)	Appendix A	R-36d	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M



	on video line 21 (both fields) as specified in 47 CFR 15.122 and EIA/CEA-608-B				
HSTDCC.68	If the Uni-Directional Receiving Device with an integrated display and without off-air tuning capability provides component analog or uncompressed digital output streams, decoding and display of this caption data (HSTDCC.1, HSTDCC.2 or HSTDCC.3) SHALL be provided according to 47 CFR 15.122	Appendix A	R-37	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	C-M
HSTDCC.67	All Uni-Directional Receiving Device's with integrated displays and without off-air tuning capability SHALL have a priori knowledge of the US region RRT and support EIA-766-A (i.e., the table is stored in the Uni-Directional Receiving Device). The US rating_region SHALL be the default rating_region for all Uni-Directional Receiving Devices.	Appendix A	R-38	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

### 3.23 High Definition Support

Item	Feature	Spec	Ref	Support	Status
HDST.15	For the manufacturer's first Uni-Directional Cable Receiving Device, manufacturer agrees to participate with cable operators and cable operator vendors in a digital interface plugfest.event.	Appendix A	R-40	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	C-M

### 3.24 Maximum Individual Carrier Amplitude

Item	Feature	Spec	Ref	Support	Status
HM1ca.1	The Uni-Directional Receiving Device SHALL not be adversely affected by the presence of the following interfering signals:  42 dBmV, 5 MHz to 30 MHz 24 dBmV, 30 MHz to 41 MHz 0 dBmV, 41 MHz to 48 MHz -10 dBmV, 48 MHz to 54 MHz	Appendix A	R-47	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

HMIca.2	The Uni-Directional Receiving Device SHALL be capable of receiving signals where the maximum rms value of any other individual signal whose frequency exceeds 54 MHz SHALL be less than 10 mV across a 75 ohm terminating impedance (+20 dBmV) measured at the input to the Uni-Directional Receiving Device.	Appendix A	R-48	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
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### 3.25RF Signal Levels and Adjacent Channel Characteristics

Item	Feature	Spec	Ref	Support	Status
HRFAcc.1	The Uni-Directional Receiving Device SHALL be capable of receiving an analog signal with a visual signal level that is within $\pm 3$ dB of the visual signal level of any adjacent analog channel (within a 6 MHz nominal frequency separation as specified in 47CFR 76.605).	Appendix A	R-49	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	The analog signal power is measured as the peak envelope power (PEP), which is the average RMS carrier power measured during horizontal sync level. The digital signal power is measured as the average RMS signal power.				I
HRFAcc.3	The Uni-Directional Receiving Device SHALL be capable of receiving NTSC analog signals with "Worst Case" Adjacent Channel performance of:  <div style="display: flex; justify-content: space-between;"> <div><b>Undesired</b></div> <div><b>D/U Ratio</b></div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div>64 QAM</div> <div>-1.0 dB</div> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div>256 QAM</div> <div>-6.0dB</div> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div>QPSK FDC</div> <div>-6.0dB</div> </div>	Appendix A	R-50	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HRFAcc.4	The Uni-Directional Receiving Device SHALL be capable of receiving digital 64 QAM The Uni-Directional Receiving Device SHALL be capable of receiving digital 64 QAM  <div style="display: flex; justify-content: space-between;"> <div><b>Undesired</b></div> <div><b>D/U Ratio</b></div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div>Analog NTSC</div> <div>-21.0 dB</div> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div>256 QAM</div> <div>-21.0dB</div> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div>QPSK FDC</div> <div>-21.0dB</div> </div>	Appendix A	R-51	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

HRFAcc.5	<p>The Uni-Directional Receiving Device SHALL be capable of receiving digital 256 QAM signals with “Worst Case” Adjacent Channel performance of:</p> <table><tr><td><b>Undesired</b></td><td><b>D/U Ratio</b></td></tr><tr><td>Analog NTSC</td><td>-16.0 dB</td></tr><tr><td>64 QAM</td><td>-11.0dB</td></tr><tr><td>QPSK FDC</td><td>-16.0dB</td></tr></table>	<b>Undesired</b>	<b>D/U Ratio</b>	Analog NTSC	-16.0 dB	64 QAM	-11.0dB	QPSK FDC	-16.0dB	Appendix A	R-52	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>Undesired</b>	<b>D/U Ratio</b>												
Analog NTSC	-16.0 dB												
64 QAM	-11.0dB												
QPSK FDC	-16.0dB												
HRFAcc.6	<p>The Uni-Directional Receiving Device SHALL be capable of receiving digital QPSK FDC signals with “Worst Case” Adjacent Channel performance of:</p> <table><tr><td><b>Undesired</b></td><td><b>D/U Ratio</b></td></tr><tr><td>Analog NTSC</td><td>-22.0 dB</td></tr><tr><td>64 QAM</td><td>-17.0dB</td></tr><tr><td>256 QAM</td><td>-22.0dB</td></tr></table>	<b>Undesired</b>	<b>D/U Ratio</b>	Analog NTSC	-22.0 dB	64 QAM	-17.0dB	256 QAM	-22.0dB	Appendix A	R-53	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
<b>Undesired</b>	<b>D/U Ratio</b>												
Analog NTSC	-22.0 dB												
64 QAM	-17.0dB												
256 QAM	-22.0dB												
HRFAcc.8	<p>Independently of meeting the requirements specified in PICS items listed above the Uni-Directional Receiving Device SHALL be capable of receiving digital 64 QAM signals with characteristics:</p> <p>1) Level = -10 dBmV on channel 82</p> <p>2) Interleaver depth of greater than or equal to I=64 (J=2)</p> <p>3) 33 dB C/N</p> <p>4) -18 dB ghost at 0.5 us</p> <p>5) 25 us burst noise not greater than -15 dBmV at 10 Hz rep rate</p>	Appendix A	R-54,	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M								
HRFAcc.8a	<p>Independently of meeting the requirements specified in PICS items listed above the Uni-Directional Receiving Device SHALL be capable of receiving digital 256 QAM signals with characteristics:</p> <p>1) Level = -7 dBmV on channel 82</p> <p>2) Interleaver depth of greater than or equal to I=64 (J=2)</p> <p>3) 36 dB C/N</p> <p>4) -18 dB ghost at 0.5 us</p> <p>5) 16 us burst noise not greater than -12 dBmV at 10 Hz rep rate</p>	Appendix A	R-54a,	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M								

### 3.26 Transport Stream Data Rates

Item	Feature	Spec	Ref	Support	Status
HstDr.1	The Uni-Directional Receiving Device SHALL support transport stream interface data rates of 26.97035Mb/s and 38.8107 Mb/s averaged over the period between the sync bytes of successive transport packets with allowable jitter of +/- one MCLKI clock period.	HPIA	6.1.1	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

### 3.27 Uni-Directional Receiving Device Functionality Without a POD Module

(The PICS items in this section apply when no POD has ever been inserted, or had been inserted and has been removed.)

Item	Feature	Spec	Ref	Support	Status
Hnop.1	The UNI-DIRECTIONAL RECEIVING DEVICE SHALL tune (and display or cause to be displayed if applicable) unscrambled analog NTSC audio-visual programming delivered in adherence to Standard, HRC or IRC frequency plans of EIA/CEA -542-A	Appendix A	R-55	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
Hnop.2	The UNI-DIRECTIONAL RECEIVING DEVICE SHALL discover, tune (and display or cause to be displayed if applicable) unscrambled digital services, delivered in adherence to Standard, HRC or IRC frequency plans of EIA/CEA -542-A.	Appendix A	R-56	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	When no POD module is present, and when a CVCT is present to describe one or more unscrambled channels, the one-part or two-part channel number from the CVCT if present shall identify each program. When the CVCT is not available, the two-part channel number from the TVCT shall identify each program.				I

Hnop.3B	When no POD module is present and when one or more unscrambled services are available in the Transport Stream, and when a CVCT is present to describe one or more of the unscrambled services, the Unidirectional Receiving Device SHALL use the CVCT for navigation to the unscrambled services.	Appendix A	R-57b	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
Hnop.3C	When no POD module is present and when one or more unscrambled services are available in the Transport Stream, and when no CVCT is present, but a TVCT is present to describe one or more of the unscrambled services, the Unidirectional Receiving Device SHALL use the TVCT for navigation to the unscrambled services.	Appendix A	R-57c	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
Hnop.17	When the Uni-Directional Receiving Device is operating without a POD any channel map created from OOB data while previously operating with a POD shall not be used.	Appendix A	R-59	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
	Based on the availability from the content provider, Digital Transport Streams that include one or more services in the clear will include virtual channel data in-band in the form of ATSC A/65A (PSIP). An in-the-clear program is one in which the PMT has no CA descriptor. A one or two-part channel number and a textual channel name will identify each channel.	HE			I
Hnop.10	The Uni-Directional Receiving Device MUST not be adversely affected by the presence of any valid PSIP data, content or structure.	Appendix A	R-60	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

### 3.28 Virtual channel number processing

VirtChan.1	When an out-of-band channel is available and profiles 4 or 5 are in use, the Uni-Directional Receiving Device SHALL use the two-part channel number in the two_part_channel_number_descriptor(), if such descriptor is present for a given channel, for identification and navigation of that channel.	Appendix A	R-60b	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
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### 3.29 Mechanical

Item	Feature	Spec	Ref	Support	Status
HMech.1	The Uni-Directional Receiving Device SHALL provide a thermal design for the POD, such that while operating with a reference power load POD drawing an average of 2.5 Watts, no non-consumer-accessible surface point SHALL be hotter than 65°C in a room where the ambient temperature is 40°C.	Appendix A	<a href="#">R-61</a>	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HMech.31	Prior to production, the manufacturer shall demonstrate or document that the Uni-Directional Receiving Device meets the requirements of 47 CFR 15.118 (c)(3) Direct pickup interference.	Appendix A	R-202	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M
HMech.7	The Uni-Directional Receiving Device SHALL meet radiated emissions limits caused by cable signals on the product's cable RF connector input in accordance with 47 CFR 76.605 (12) (15 uV/m at 30 m for frequencies outside the range 54 to 216 MHz and 20 uV/m at 3 m for frequencies inside the range 54 to 216 MHz).	Appendix A	R-200	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>	M

## Appendix A – CableLabs/CEA Agreed Requirements Not Contained In Referenced Standards

### A.1 Normative References

	<b>HF</b>	EIA/CEA-542-A Cable Television Channel Identification Plan April 2002	Secondary reference of SCTE 40 2001 (Formerly DVS 313) Digital Cable Network Interface Standard
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### A.2 Requirements

**R-1** The Uni-Directional Receiving Device SHALL be capable of supporting a draw of up to 250mA while maintaining 3.3V +/- 0.3 VDC (per POD) on the VPP pins before reading the Card Information Structure (CIS).

**R-2** If the Uni-Directional Receiving Device does support the value of 0x3h in the Power field of the Feature Selection Byte (TPCE\_FS), the Uni-Directional Receiving Device SHALL supply either 3.3V or 5V as requested on VPP1 and VPP2 pins.

**R-3**

**R-3a** If the Uni-Directional Receiving Device is operating in the Polling mode, it SHALL poll the POD no less frequently than once every 100 mSec.

**R-3b** If the Uni-Directional Receiving Device is operating in the interrupt mode, it SHALL respond to interrupts within 100 mSec and poll the POD no less frequently than once every 5 seconds

**R-4** For UDRDs sold or marketed after July 1, 2005, conducted emissions (including LO and spurious) at the RF input SHALL be less than or equal to -30 dBmV over the range 54 MHz to 864 MHz and -26 dBmV over the range 5 MHz up to but not including 54 MHz, measured with a 9 kHz bandwidth.

**R-9** Uni-Directional Receiving Device SHALL be able to process MPEG-2 compliant Transport Streams in accordance with ANSI/SCTE-54 2002 as amended by DVS/435r4.

**R-9a** Uni-Directional Receiving Device SHALL not be adversely affected by the presence of an incorrect service location descriptor in the PSIP TVCT.

**R-10** Uni-Directional Receiving Device SHALL not be adversely affected by the presence or absence of descriptors not identified as required elsewhere in this document.

**R-11** The Uni-Directional Receiving Device SHALL be able to navigate (tune) using the System information when it is carried in OOB-FDC, as described in reference NIR.

**R-12** The Uni-Directional Receiving Device SHALL be able to demodulate signals compliant with the SCTE 07 2000 for the transmission, Physical layer modulation, coding, synchronization, and Error Correction.

**R-13** The Uni-Directional Receiving Device shall have tuning agility over the range of 54 MHz to 864MHz (IRC/HRC/Standard Channel Plans).

**R-14** RF Input Impedance SHALL have a nominal impedance of 75 ohms unbalanced.

**R-15** The Uni-Directional Receiving Device RF Input Return Loss SHALL be 3 dB minimum over full tuning range.

**R-16** The Uni-Directional Receiving Device SHALL tune and receive Analog visual carrier signals over the RF Input Level Range from 0 dBmV minimum to +15 dBmV maximum.

**R-17** The Uni-Directional Receiving Device SHALL tune and receive Analog aural carrier signals over the RF Input Level Range from -10 to -17 dBc.

**R-18** The Uni-Directional Receiving Device SHALL tune and receive Digital 64 QAM signals over the RF Input Level Range from -15 dBmV to +15 dBmV.

**R-19** The Uni-Directional Receiving Device SHALL tune and receive Digital 256 QAM signals over the RF Input Level Range signal from -12 dBmV to +15 dBmV.

**R-20** The Uni-Directional Receiving Device SHALL tune and receive Standard/HRC/IRC signals that deviate over the allowable FCC tolerance range as described in 47 CFR 76.612.

**R-23** The Uni-Directional Receiving Device SHALL not be adversely affected by AM Hum Modulation on digital carriers of less than or equal to 3% p-p.

**R-24** The Uni-Directional Receiving Device SHALL tune and receive with Group Delay Variation of  $\leq 0.25 \mu\text{sec}/\text{MHz}$  across the 6-MHz channel. with Group Delay Variation introduced such that the Chroma/Luma delay of CFR47.76, the Amplitude Ripple of HFATrf.32 and the Microreflections of HFATrf.29 are not exceeded.

**R-25** The Uni-Directional Receiving Device SHALL tune and receive with Phase Noise of  $\leq -86 \text{ dBc}/\text{Hz}$  @ 10 kHz offset (relative to the center of QAM signal spectrum).

**R-26** The Uni-Directional Receiving Device SHALL tune and receive with Amplitude Ripple on digital channels of  $\leq 5 \text{ dB p-p}$  within the 6-MHz channel with Amplitude Ripple introduced such that the Chroma/Luma delay is less than CFR47.76, Group Delay Variation of HFATrf.26, and the Microreflections of HFATrf.29 are not exceeded.

**R-27** The Uni-Directional Receiving Device SHALL tune and receive with Amplitude Ripple on analog channels of  $\leq 4 \text{ dB p-p}$  within the 6-MHz channel. with Amplitude Ripple introduced such that the Chroma/Luma delay is less than CRF47.76, Group Delay Variation of HFATrf.26 and the Microreflections of HFATrf.29 are not exceeded.

**R-28** The Uni-Directional Receiving Device SHALL tune and receive with Microreflections of: (assumes one dominant echo with max. specified amplitude in dB relative to the primary QAM signal)

-10 dB at  $< 0.5 \mu\text{s}$

-15 dB at  $< 1 \mu\text{s}$

-20 dB at  $< 1.5 \mu\text{s}$

-30 dB at  $< 4.5 \mu\text{s}$

With Microreflections introduced such that the Chroma/Luma delay is less than CFR47.76, Group Delay Variation of HFATrf.26 and the Amplitude Ripple of HFATrf.32 are not exceeded.



**R-29** The Uni-Directional Receiving Device SHALL tune and receive signal with an interleaver depth of greater than or equal to  $I = 64$  Burst Noise of not longer than 25- $\mu$ s at 10-Hz repetition rate.

**R-30** The Uni-Directional Receiving Device SHALL be capable of receiving symbols transmitted with a Frequency Stability of of +/- 50 ppm measured at the upper limit of the frequency range.

**R-31** The Uni-Directional Receiving Device SHALL be capable of receiving FDC with a RF Input level range of -15 to +15 dBmV.

**R-32** The Uni-Directional Receiving Device SHALL tolerate a Group Delay variation in channel, measured over Nyquist bandwidth of 200 ns max in channel. With Group Delay Variation introduced such that the Chroma/Luma delay is less than or equal to the Amplitude Ripple of HFATrf.32 and the Microreflections of HFATrf.29 are not exceeded.

**R-33** The Uni-Directional Receiving Device SHALL not be adversely affected by any audio service type (bsmod) defined in HD Annex B Table B2.

**R-34** The Uni-Directional Receiving Device SHALL receive analog channels that are NTSC RF AM-VSB modulated signals in accordance with current cable-system practice and applicable FCC rules.

**R-35** For analog NTSC, closed captions are carried in line 21 of the vertical blank line (VBI). The encoding of NTSC closed caption is based on FCC part 15.119 and CEA/EIA-608-B. Uni-Directional Receiving Devices with integrated displays and without off-air tuning capability SHALL be able to display this information.

**R-36** The Uni-Directional Receiving Device SHALL process and extract closed captioning information from MPEG picture level user\_data() fields formatted and transported using ANSI SCTE 21 2001, when present, identified with user\_data\_type\_code value of '0x03' and cc\_type values '00' and '01' and carried in the cc\_data\_1 and cc\_data\_2 fields.

**R-36a** Uni-Directional Receiving Devices built before July 1<sup>st</sup>, 2008, SHALL process and extract closed captioning information from MPEG picture level user\_data() fields formatted and transported using ANSI SCTE 20 2001, when present, unless MPEG picture level user\_data() fields formatted and transported using SCTE 21 is also available.

**R-36b** In the case where a MPEG picture level user\_data() field includes data formatted and transported via both aforementioned methods (SCTE 20 and SCTE 21), the Uni-Directional Receiving Device MAY use closed captioning data recovered from either method.

**R-36c** In the case where a MPEG picture level user\_data() field formatted and transported via SCTE 21 includes any cc\_type values of '10' or '11', the Uni-Directional Receiving Device MAY use such data exclusively for captioning operation, notwithstanding the output requirements of HSTDCC.4.

**R-36d** The Uni-Directional Receiving Device SHALL, on all NTSC analog outputs, modulate such extracted data (R-36, R-36a, R-36b) on video line 21 (both fields) as specified in 47 CFR 15.122 and EIA/CEA-608-B

**R-37** If the Uni-Directional Receiving Device with an integrated display and without off-air tuning capability provides component analog or uncompressed digital output streams, decoding and display of this caption data (R-36, R-36a, R-36b) SHALL be provided according to 47 CFR 15.122

**R-38** All Uni-Directional Receiving Devices with integrated displays and without off-air tuning capability SHALL have a priori knowledge of the US region RRT and support EIA-766-A (i.e., the table is stored in the Uni-Directional Receiving Device). The US rating\_region SHALL be the default rating\_region for all Uni-Directional Receiving Devices.

**R-40** For the manufacturer's first Uni-Directional Cable Receiving Device, manufacturer agrees to participate with cable operators and cable operator vendors in a digital interface plugfest event.

**R-47** The Uni-Directional Receiving Device SHALL not be adversely affected by the presence of the following interfering signals:

42 dBmV, 5 MHz to 30 MHz  
 24 dBmV, 30 MHz to 41 MHz  
 0 dBmV, 41 MHz to 48 MHz  
 -10 dBmV, 48 MHz to 54 MHz

**R-48** The Uni-Directional Receiving Device SHALL be capable of receiving signals where the maximum rms value of any other individual signal whose frequency exceeds 54 MHz SHALL be less than 10 mV across a 75 ohm terminating impedance (+20 dBmV) measured at the input to the Uni-Directional Receiving Device.

**R-49** The Uni-Directional Receiving Device SHALL be capable of receiving an analog signal with a visual signal level that is within  $\pm 3$  dB of the visual signal level of any adjacent analog channel (within a 6 MHz nominal frequency separation as specified in 47CFR 76.605).

**R-50** The Uni-Directional Receiving Device SHALL be capable of receiving digital and NTSC analog signals with "Worst Case" Adjacent Channel performance of:

Undesired	D/U Ratio
64 QAM	-1.0 dB
256 QAM	-6.0dB
QPSK FDC	-6.0dB

**R-51** The Uni-Directional Receiving Device SHALL be capable of receiving digital 64 QAM The Uni-Directional Receiving Device SHALL be capable of receiving digital 64 QAM

Undesired	D/U Ratio
Analog NTSC	-21.0 dB
256 QAM	-21.0dB
QPSK FDC	-21.0dB

**R-52** The Uni-Directional Receiving Device SHALL be capable of receiving digital 256 QAM signals with "Worst Case" Adjacent Channel performance of:

Undesired	D/U Ratio
Analog NTSC	-16.0 dB
64 QAM	-11.0dB
QPSK FDC	-16.0dB

**R-53** The Uni-Directional Receiving Device SHALL be capable of receiving digital QPSK FDC signals with "Worst Case" Adjacent Channel performance of:

<i>Undesired</i>	<i>D/U Ratio</i>
<i>Analog NTSC</i>	<i>-22.0 dB</i>
<i>64 QAM</i>	<i>-17.0dB</i>
<i>256 QAM</i>	<i>-22.0dB</i>

**R-54** *Independently of meeting the requirements listed above the Uni-Directional Receiving Device SHALL be capable of receiving digital QAM 64 signals with the following characteristics:*

- 1.) Level = -10 dBmV on channel 82*
- 2.) Interleaver depth of greater than or equal to I=64 (J=2)*
- 3.) 33 dB C/N*
- 4.) -18 dB ghost at < 0.5  $\mu$ sec.*
- 5.) 25  $\mu$ sec burst noise not greater than -15 dBmV at a 10 Hz repetition rate.*

**R-54a** *Independently of meeting the requirements listed above the Uni-Directional Receiving Device SHALL be capable of receiving digital QAM 256 signals with the following characteristics:*

- 1.) Level = -7 dBmV on channel 82*
- 2.) Interleaver depth of greater than or equal to I=64 (J=2)*
- 3.) 36 dB C/N*
- 4.) -18 dB ghost at < 0.5  $\mu$ sec.*
- 5.) 16  $\mu$ sec burst noise not greater than -12 dBmV at a 10 Hz repetition rate.*

**R-55** *The UNI-DIRECTIONAL RECEIVING DEVICE SHALL tune (and display or cause to be displayed if applicable) unscrambled analog NTSC audio-visual programming delivered in adherence to Standard, HRC or IRC frequency plans of EIA/CEA-542-A*

**R-56** *The UNI-DIRECTIONAL RECEIVING DEVICE SHALL discover, tune (and display or cause to be displayed if applicable) unscrambled digital services, delivered in adherence to Standard, HRC or IRC frequency plans of EIA/CEA-542-A.*

**R-57b** *When no POD module is present and when one or more unscrambled services are available in the Transport Stream, and when a CVCT is present to describe one or more of the unscrambled services, the Unidirectional Receiving Device SHALL use the CVCT for navigation to the unscrambled services.*

**R-57c** *When no POD module is present and when one or more unscrambled services are available in the Transport Stream, and when no CVCT is present, but a TVCT is present to describe one or more of the unscrambled services, the Unidirectional Receiving Device SHALL use the TVCT for navigation to the unscrambled services.*

**R-59** *When the Uni-Directional Receiving Device is operating without a POD any channel map created from OOB data while previously operating with a POD shall not be used.*

**R-60** *The Uni-Directional Receiving Device MUST not be adversely affected by the presence of any valid PSIP data, content or structure.*

**R-60b** When an out-of-band channel is available and profiles 4 or 5 are in use, the Uni-Directional Receiving Device SHALL use the two-part channel number in the two\_part\_channel\_number\_descriptor(), if such descriptor is present for a given channel, for identification and navigation of that channel.

**R-61** The Uni-Directional Receiving Device SHALL provide a thermal design for the POD, such that while operating with a reference power load POD drawing an average of 2.5 Watts, no non-consumer-accessible surface point is hotter than 65°C in a room where the ambient temperature is 40°C.

**R-100** The Uni-Directional Receiving Device SHALL be able to tune FDC signals over the range from 70 MHz to 130 MHz.

**R-101** The Uni-Directional Receiving Device SHALL be able to tune any nominal carrier frequency in the FDC that is an integer multiple of 250 kHz between the minimum and maximum carrier frequencies, inclusive and the specific fixed frequency of 104.200 MHz.

**R-102** When the Host / POD pairing information screen application info APDU is selected after the POD has provided an invalid certificate to the Uni-Directional Receiving Device, then the UDRD SHALL generate and display the following message: "Please call your cable operator and report an invalid CableCARD"

**R-200** The Uni-Directional Receiving Device SHALL meet radiated emissions limits caused by cable signals on the product's cable RF connector input in accordance with 47 CFR 76.605 (15 uV/m at 30 m for frequencies outside the range 54 to 216 MHz and 20 uV/m at 3 m for frequencies inside the range 54 to 216 MHz).

**R-201** Uni-Directional Receiving Devices with integrated display and without off-air tuning capability that also provide component analog or uncompressed digital output streams, SHALL decode and display content advisory dataas defined by CEA/EIA-608-B and required by FCC 47 CFR Part 15.120

**R-202** Prior to production, the manufacturer shall demonstrate or document that the Uni-Directional Receiving Device meets the requirements of 47 CFR 15.118 (c)(3) Direct pickup interference.

**R-300** The Uni-Directional Receiving Device SHALL validate the X.509 version 3 certificates as defined in Table 1

**R-301** The Uni-Directional Receiving Device signature mechanism SHALL use SHA-1 with RSA Encryption with specific OID 1.2.840.113549.1.1.5

**R-302** The Uni-Directional Receiving Device SHALL have a Root CA Certificate as defined in Table 1

**Table 1 – CableLabs Manufacturer Root CA Certificate**

Certificate Field	Certificate Field Description
Subject Name Form	C=US O=CableLabs CN=CableLabs Manufacturer Root CA
Intended Usage	This certificate is used to issue Manufacturer CA Certificates.
Signed By	Self-Signed

Validity Period	30+ years. It is intended that the validity period is long enough that this certificate is never re-issued.
Modulus Length	2048
Extensions	keyUsage[c,m](keyCertSign, cRLSign) subjectKeyIdentifier[n,m] basicConstraints[c,m](cA=true)

***R-303 The Uni-Directional Receiving Device SHALL have a CA Certificate as defined in Table 2***

**Table 2 – Manufacturer CA Certificate**

Certificate Field	
Certificate Field Description	
Subject Name Form	C=<country> O=<CompanyName> [S=<state/province>] [L=<city>] OU=JTS [OU=<Manufacturer's Facility>] CN=<CompanyName> Mfg CA
Intended Usage	This certificate is issued to each Manufacturer by the CableLabs Manufacturer Root CA and can be provided to each device either at manufacture time, or during a field code update. This certificate appears as a read-only parameter in the device.  This certificate issues Device Certificates.  This certificate, along with the CableLabs Manufacturer Root CA Certificate and the Device Certificate, is used to authenticate the device identity
Signed by	CableLabs Manufacturer Root CA
Validity Period	30 Years
Modulus Length	2048
Extensions	keyUsage[c,m](keyCertSign, cRLSign) subjectKeyIdentifier[n,m] authorityKeyIdentifier[n,m](keyIdentifier=<subjectKeyIdentifier value from CA certificate>) basicConstraints[c,m](cA=true, pathLenConstraint=0)

***R-304 The Uni-Directional Receiving Device SHALL validate the keyUsage extension with the keyCertSign and cRLSign bits asserted, and have the critical and mandatory flags set in the CA Certificate as received from the POD.***

***R-305 The Uni-Directional Receiving Device SHALL validate the subjectKeyIdentifier extension composed of a keyIdentifier value which SHALL be the 160-bit SHA-1 hash of the value of the BIT***

**STRING subjectPublicKey (excluding the tag, length, and number of unused bits from the ASN1 encoding) and have the non-critical and mandatory flags set in the CA Certificate as received from the POD.**

**R-306 The Uni-Directional Receiving Device SHALL validate the authorityKeyIdentifier extension which SHALL include a keyIdentifier value that is identical to the subjectKeyIdentifier in the CA certificate and have the non-critical and mandatory flags set in the CA Certificate as received from the POD.**

**R-307 The Uni-Directional Receiving Device SHALL validate the basicConstraints extension using the parameters cA true and pathLenConstraint = 0 and have the critical and mandatory flags set in the CA Certificate as received from the POD.**

**R-308 The Uni-Directional Receiving Device, SHALL have a Device Certificate as defined in Table 3**

**Table 3 Device Certificate**

<b>Certificate</b>	
<b>Certificate Field Description</b>	
Subject Name Form	C=<country> O=<Company Name> [ST=<state/province>] [L=<city>] OU=JTS [OU=<Product Name>] [OU=<Manufacturer's Facility>] CN=<POD ID or Host ID>
Intended Usage	This certificate is issued by the Manufacturer CA and installed in the factory. The NMS server cannot update this certificate. This certificate appears as a read-only parameter in the Device. This certificate is used to authenticate the device identity.
Signed By	Manufacturer CA
Validity Period	30 years
Modulus Length	1024
Extensions	keyUsage[c,m](digitalSignature, keyEncipherment), authorityKeyIdentifier [n, m](keyIdentifier=<subjectKeyIdentifier value from CA certificate>)

**R-309 The Uni-Directional Receiving Device SHALL validate the keyUsage extension with the digitalSignature and keyEncipherment bits asserted, and have the critical and mandatory flags set in the Device Certificate as received from the POD.**

**R-310** The Uni-Directional Receiving Device SHALL validate the authorityKeyIdentifier extension which SHALL include a keyIdentifier value that is identical to the subjectKeyIdentifier in the certificate and have the non-critical and mandatory flags set in the Device Certificate as received from the POD.

**R-311** The Uni-Directional Receiving Device Host\_ID MUST be expressed as hexadecimal digits. The Alpha HEXcharacters (A-F) MUST be expressed as uppercase letters.

**R-312** The Uni-Directional Receiving Device Host\_ID defined in the CN field of the X.509 certificate SHALL comply with the following requirements:

- CableLabs assigns a random 3 decimal digit Host manufacturer number upon request by any DFAST signatory who has successfully completed Host certification.
- Host manufacturers shall set the 10 most significant bits of the 40-bit Host\_ID to the binary equivalent of their assigned Host manufacturer number
- Host manufacturers shall set the remaining 30-bits of the Host\_ID to a value between zero and 999,999,999 decimal, 11,1011,1001,1010,1100,1001,1111,1111 binary, 3B9AC9FF hexadecimal, to facilitate on-screen presentation to subscribers and manual report back
- The Host\_ID (30-bits) assigned to each Host device certificate SHALL be unique to each Host device.

**R-313** The Uni-Directional Receiving Device rules for certificate chain validation of POD Device and CableLabs CA certificates SHALL fully comply with IETF RFC 3280 where they are referred to as "Certificate Path Validation."

Note: This requirement is for verification of the Host ability to perform certificate chain validation of the POD.

**R-314** The Uni-Directional Receiving Device SHALL validate that the start date for any end-entity certificate SHALL be the same as or later than the start date of the issuing CA certificate validity period.

**R-315** The Uni-Directional Receiving Device SHALL validate that the period of the POD's device certificate SHALL begin with the POD's date of manufacture and extend to not greater than 30 years after the POD's date of manufacture.

**R-316** The Uni-Directional Receiving Device SHALL be able to handle certificate serialNumber values up to 20 octets

**R-317** Unidirectional Digital Cable Products shall be designed and manufactured in a manner to effectively frustrate attempts to discover or reveal (i) the unique number, of a specified bit length, assigned to each Unidirectional Digital Cable Product, the numbers used in the process for encryption or decryption of Controlled Content, or the private key used in the process for encryption or decryption of Controlled Content (collectively, "**Keys**") and (ii) the methods and cryptographic algorithms used to generate such Keys. For the avoidance of doubt, Keys includes the private key used for authentication. All authentication private keys shall be protected using encryption or obfuscation methods when being transferred across internal buses and stored in memory.